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Research Article

# The Trichoptera of Panama XXVII. The third benchmark—a waypoint to the future

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## Abstract

The flora and fauna of Panama is species-rich due to its location and topography, and the resulting diversity of microclimates and habitats. The last two summaries (benchmarks) of information about the caddisfly fauna (Insecta, Trichoptera) Panama were published in1992 and 2015. From 1861 to 2015, researchers from outside of Panama recorded 13 families, 45 genera, and 257 species of caddisflies. From 2015 through 2023, a series of publications by the Aquatic Invertebrate Research Group at the Universidad Autónoma de Chiriquí in David, Panamá have recorded an additional 2 families,11 genera, and 278 species. Thus, a total of 535 species of caddisflies, now recorded from the Republic of Panama, are distributed among 15 families and 56 genera. Panama's Trichoptera fauna shows greatest affinity to other Central American countries, and to Costa Rica in particular. Indeed, 289 Costa Rican species are shared with Panama, including 91 former Costa Rican endemics now known from both countries. The Hydroptilidae is the most species rich family in Panama. Although the number of new species and new country records of macro-Trichoptera has diminished somewhat over this third benchmark period, no similar fall-off has yet been detected in the micro-Trichoptera. The caddisfly fauna of Panama is now better known, but much more work remains to define the fauna and, just as importantly, to map the surficial and altitudinal distribution of each genus and species.

**Key words:** Biodiversity, biogeography, caddisflies, Neotropics, regional affinities

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## Introduction

Aguila (1992) published the first benchmark for caddisflies (Insecta, Trichoptera) known from the Republic of Panama, wherein 168 species in 39 genera and 13 families were listed. Through 2015, a large number of papers by researchers outside Panama, dealing either directly or peripherally with Panama, produced a net gain of 7 genera and 89 species to its fauna. Beginning in 2015 and through 2023, a group of researchers led by the first author, a permanent resident of Panama, have more than doubled the known caddisfly fauna (Armitage et al. 2015a, 2015b, 2016, 2018, 2020, 2021, 2022a, 2022b, 2023, 2024; Harris and Armitage 2015, 2019, 2023; Armitage and Harris 2018a, 2018b, 2018c, 2020, 2023; Thom-

son and Armitage 2018, 2021; Blahnik and Armitage 2019; Rázuri-Gonzales and Armitage 2019; Thomson et al. 2022; Blahnik et al. 2023; Harris et al. 2023; Harris et al. 2024). As part of this effort, three publication series were initiated on aquatic insects, and the Aquatic Invertebrate Research Group (AIRG) was formed, now associated with the Museo de Peces de Agua Dulce e Invertebrados (MUPADI) at the Universidad Autónoma de Chiriquí (UNACHI) in David. The caddisfly fauna of Panama now includes 15 families, 56 genera, and 535 species.

Herein, we present an historical summary of published Trichoptera research in Panama. From these sources, an up-to-date list of caddisflies for Panama is provided, including type country and country distribution for each species. We also present a list of all collection locations to date, including latitude, longitude, altitude, and each stream's Global ID. And, we discuss the geographic affinities of the Panamanian caddisfly fauna. Finally, we give a comprehensive list of references pertinent to caddisfly work in Panama.

## Materials and methods

### Geomorphology and topography of Panama

A small portion of southern Nicaragua, Costa Rica and Panama comprise an isthmus which serves as a bridge between northwestern South America and the remainder of the northern Neotropics and Nearctic regions. Most of this isthmus is composed of two of the four structural regions, or blocks, which make up Central America. Two continental blocks in the north, the Maya block (northern Guatemala; southern margin of the North American continent) and the Chortis block (only continental part of the Caribbean plate), the latter extending southeastward to include much of Nicaragua. Costa Rica and western Panama are part of the Chorotega block, and eastern Panama is part of the Choco block. The formation of these latter blocks and the resulting closure of the isthmus are thought to have come about through subduction of ocean plates followed by volcanism (Bundschuh and Alvarado 2007). Four oceanic plates (Caribbean, South American, Cocos, and Nazca) surround and/or underlie these two blocks, creating a region of very complex tectonics.

Most of the Chorotega and Choco blocks are regarded as a Neogene–Quartenary volcanic belt underlain by a Mesozoic basement layer derived from the Caribbean plate (Coates 1997). Most of the major water basins (cuencas) which formed in Panama, as well as those in Costa Rica, were subsequently created by erosion of these landforms and the concomitant formation of groundwater networks. However, some sections of the Caribbean coast are of more recent origin (Middle Quaternary to Holocene), formed by landslides from the Cordillera de Talamanca and Central Cordillera ranges which covered older, underlying coral formations along the coast (Harris and Armitage 2019). During the Flandrian Transgression (Holocene: 7000–6500 years BP), the Caribbean Sea invaded the coastal areas (Bergoeing 2015), submerging watersheds which existed at that time. "Subsequent recedence of sea water, on-going neotectonic activity, and fluvial erosion" helped to form some of Panama's Caribbean coastal drainages we find today (Harris and Armitage 2019).

Topographically, Panama exhibits a defined progression from west to east (Fig. 1A). East of the Central Valley in Costa Rica, the towering Talamanca range rises,

extending southeastward into Panama and terminating at Cerro Punta north of Volcán Barú. Cerro Punta is one of the principal agricultural centers in Panama, with fresh vegetables and fruits grown upon its slopes. The massive Talamanca range represents a volcanic gap between the volcanic ranges forming the backbone of Central America and the Central Cordillera of Panama. It formed, in part, due to uplift caused by the subduction of the Cocos Ridge beneath it, choking off volcanic activity. The majority of La Amistad International Park in Costa Rica and Panama is occupied by this range. Volcán Barú, just south of the terminus of the Talamanca range begins the Central Cordillera backbone of Panama, which extends east to the Panama Canal lowlands. In addition to Volcán Barú, the Central Cordillera of Panama includes several other Quaternary volcanoes such as La Yeguada and El Valle. South of the volcanic front provinces lies the Chorotega forearc provinces found along the Pacific coast from northern Costa Rica to the Gulf of Panama. It is characterized by a series of peninsulas. In Panama the most western peninsula, Burica, is shared with Costa Rica near Puerto Armuelles. Moving eastward, the second peninsula is called Soná, after the town of the same name. The third and largest peninsula is Azuero. These peninsulas and the nearby Coiba Island include accreted terrains transported in the past by the Pacific plate as it underwent subduction under the Caribbean plate and incorporated themselves into Panama's landmass. Beyond the Canal Zone basin, east of Panama City, sets of rugged mountains bracket, to the north and south, the Darién lowland basin. Along the Caribbean coast arise the San Blás and Darién ranges, and along the Pacific coast can be found the Majé, Bagre, and Sapo ranges.

## Hydrology

The Smithsonian Tropical Research Institute has recently produced a GIS shapefile for streams in Panama, digitized from 1:50,000 topographic maps produced by the National Geographic Institute Tommy Guardia in Panama (STRI 2023). Examination of the attributes for this file indicate that Panama has 6,326 named quebradas (creeks) and 1,387 named ríos (rivers). In addition, there are 24,386 quebradas and 153 ríos that remain unnamed. Despite the plentiful rainfall that falls on Panama, some of these streams are intermittent due to the alternation of wet and dry seasons and the vagaries of groundwater supply. Many others have their flow supplemented from springs or other water sources and flow continuously throughout the year. In addition, Panama hosts numerous temporary and permanent ponds, a number of lakes, estuaries, canals, and lagoons. Increasingly over the last decade, hydroelectric dams have been constructed throughout Panama which transform formerly flowing streams into lentic reservoirs.

With so many streams, most of them short due to the narrowness of the isthmus, there was a need to organize them above the individual watershed level. This was largely achieved by the Central American Hydrometeorological Project (UNESCO 2008), an international effort to characterize major cuencas (water basins) in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama, and to facilitate processing and exchange of hydrographic and meteorological data. As a result, Panama has 52 defined cuencas (Fig. 1B). Typically, a cuenca descriptor (major basin number: 087–160) is associated with each new recorded species and mainland location. An overview and analysis of 26 of these cuencas can be found in Cornejo et al. (2017).

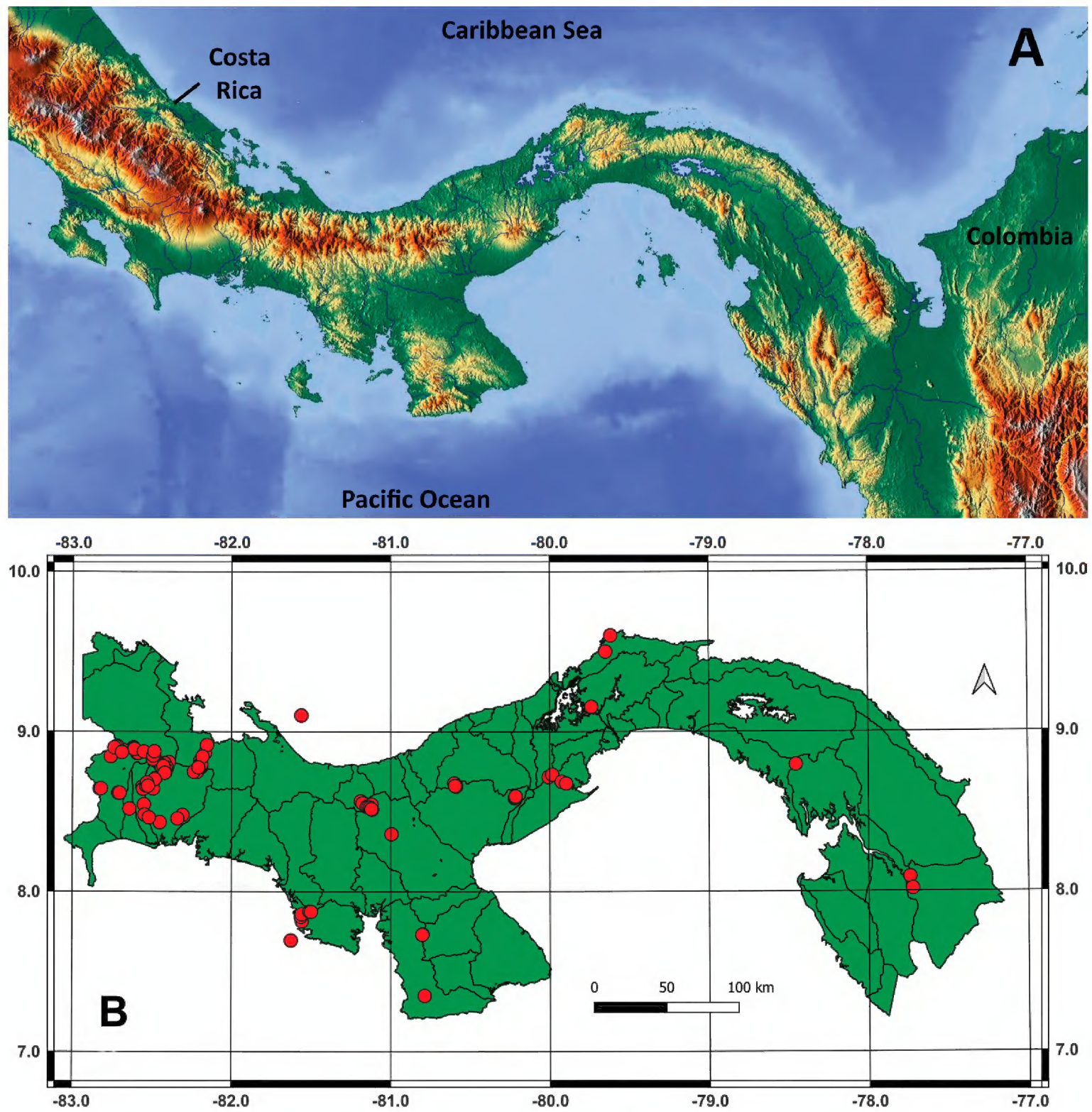


**Figure 1.** Maps **A** relief map of Panama **B** hydrographic map showing major watersheds (cuencas) of Panama with an overlay of locations collected during 2015–2023.

**Climate** (https://www.imhpa.gob.pa/es/descripcion-generall-clima-panama)

Because of the restricted latitudinal range (7–18°N), the current climate throughout Central America is generally the same: broadly tropical and seasonal, with wet and dry seasons (Bundschuh and Alvarado 2007). Given its east-west orientation (as opposed to Central America's general NW–SE orientation) and a more attenuated latitudinal range (~7.2–9.6°N), Panama has an even more uniform climate. Yet, some variation can occur with season, altitude, and time of day. Particularly in the western highlands, a variety of microclimates can exist in a relatively small land area.

Temperatures (annual mean temperature 27.0 °C in January and July), however, are ameliorated somewhat along the Caribbean coast to the north and the Pacific coast to the south due to these large, adjacent waterbodies and the cycling of on-shore/off-shore winds throughout the day. Inland, however this lessening decreases rapidly. Maximum mean temperatures oscillate between 31.1 °C and 34.5 °C. Minimum temperatures range from 20.1 °C and 22.4 °C. Perhaps the largest decreasing gradient of temperature occurs with increasing altitude, particularly in the western highlands (Chorotega block).

The two well-defined seasons in most of Panama, are controlled by the migration of the Intertropical Convergence Zone (ITCZ), which in turn is controlled by the movement of the sun in relation to the earth. The dry season occurs when the ITCZ is south of Panama, permitting the trade winds from the North Atlantic gyre to sweep across the Caribbean and most of Central America. Generally, the wet season (1900 mm mean annual precipitation) begins when the ITCZ begins to move over Panama in a northerly direction. The ITCZ reaches its northernmost position between July and August, producing a short, secondary dry period (Veranillo). As the ITCZ starts to move south again, rains resume, heavier than before, especially in October and November. Rainfall in the Pacific region of Panama is abundant, with moderate to heavy intensity, and includes convective thunderstorms, typically in the afternoon. The rainy season begins in May and lasts through November. The dry season occurs during December through April. In the Central Region (away from the coasts) the seasons occur in a similar manner to the Pacific region. However, the more continental nature of the land as well as the thermal and orographic contrasts with altitude play an important role. The dry season has strong trade winds coming from the Caribbean, and the wet season has moderate to heavy rains after the middle of the day. In the Atlantic (Caribbean) region it rains almost throughout the year. These rains can be caused by frontal system incursions from the northern hemisphere, particularly in the December to February period. Otherwise, rains are associated with tropical atmospheric systems over the Caribbean basin, as well as other factors (UNESCO 2008). The volcanic soils that cover much of Panama normally allow for rapid drainage. Climate variability in Panama is driven mainly by the El Niño Southern Oscillation, tropical cyclones, and sea surface temperatures. No hurricanes or tornados impact Panama directly. However, a stalled tropical cyclone in the Caribbean north of Panama can send belts of heavy rainfall which impact the western highlands area. Such an event occurred as recently as 2020 causing flooding, landslides, and scouring of streams, particularly in the upper Rio Chiriquí Viejo Cuenca adjacent to the Costa Rican border.

## Methods

The results were taken from the published literature, presumably all peer-reviewed, spanning the period from 1861 through March, 2024. Approximately 70% of the species described or recorded by others between 1861 and 2015 have been re-collected and identified during the period 2015–2024, attesting to their historical accuracy and continued presence in Panama.

The majority of the collections made in alcohol by AIRG employed light traps (UV fluorescent tubes or an UV LED strips). Whenever possible, we also set up Malaise traps in the same locations, because the combination of UV light traps and Malaise traps has consistently produced the best results in terms of species diversity. Sampling monthly from December to June has produced very good results, equivalent to whole year sampling. Sampling just once at a given location produces insufficient information about the species assemblage present. Once again, optimum results are achieved with multiple-month collections at the same site and with the two collection methods stated above.

The relief map was provided courtesy of Hans Braxmeier, Donaustraße 13, 89231 Neu-Ulm, Germany. Other maps were created in QGIS software, version 3.28.5-Firenze. There are two overlapping series of literature citations in this doc-

ument: one for the first literature source for each Panamanian species (Table 1) plus the text citations, and one derived from the original descriptions for each species (species authorities). We have opted to include only the former to avoid any confusion and to improve the use and readability of the References section. Literature references for original descriptions based on the authority and year, can be found using Holzenthal and Calor (2017). We follow the order and hierarchy presented in Holzenthal et al. (2015). One species, *Metrichia* PA-1, represents a provisional designation, and which has been described and illustrated in the literature (Thomson and Armitage 2021), but not officially named at present. Although the genitalia were distinct from all other species in this genus, the holotype male was without a head. We exercised caution by not formally naming this species, and are curently searching for more specimens. Appendix 1: Tables A1, A2 are placed at the end of the manuscript due to their size.

## Results

### Historical review of Trichoptera taxonomic research in Panama

The first caddisfly described and recorded from Panama was the hydropsychid, *Smicridea bivittata* by Hagen (1861) from the Panama Canal Zone. This is a very common species present in many lowland and midland locations throughout Panama. For the next 100 years, only three additional species accrued to Panama's fauna. However, in the subsequent 40 years, until 2000, a significant increase in species numbers was recorded thanks primarily to the work of Oliver S. Flint, Jr. at the Smithsonian Institution. It was also during this period that Joaquin Bueno-Soria, Ralph Holzenthal, Roger Blahnik, and Steve Harris, among a few others, began to make contributions in the form of new species' descriptions and new country records. Also, during this pre-2000 period, McElravy et al. (1981) generated the first significant species assemblage for Panama, and Aguila (1992) published the first benchmark paper for this group. From 2000 to 2015, these same scientists made even more contributions, with additional descriptions and records provided by Silvia Santiago-Fragoso, Kjell Johanson, Aysha Prather, Lourdes Chamorro, Trond Andersen, János Oláh, Fernando Muñoz-Quesada, Ernesto Rázuri-Gonzales, and Robin Thomson, among a few others (Table 1). The sum of all the above work resulted in 13 families, 45 genera, and 257 species being recorded from Panama during the period 1861 through part of 2015.

The Aquatic Invertebrate Research Group (AIRG) was formed in 2018 from employees and research associates of MUPADI. Previously, beginning in 2015, the first author initiated a series of three publication series for recording results of work on the Trichoptera, Plecoptera, and Diptera of Panama. In 2018, these series were formally transferred to AIRG and MUPADI for purposes of continued identification of our progress. The authors of this manuscript are/were the primary contributors to the publication series for caddisflies. From 2015 through 2024, AIRG has described and/or recorded an additional 2 families, 11 genera, and 278 species of Trichoptera. The trichopteran fauna of Panama now consists of 15 families, 56 genera, and 535 species. Fig. 2 displays the increase in Panama's Trichoptera fauna since inception. All of the literature citations for publications in which caddisfly species were first recorded from Panama are presented in Table 1, and the number of species recorded in each citation is included.

**Table 1.** Primary Literature Sources for Panama Trichoptera by year.

| Primary Literature Source | # Taxa | Primary Literature Source | # Taxa |
|---|---|---|---|
| Hagen 1861 | 1 | Harris and Flint 2002 | 5 |
| Mosely 1933 | 1 | Harris et al. 2002a | 2 |
| Ross 1959 | 2 | Harris et al. 2002b | 1 |
| Denning and Sykora 1966 | 1 | Flint et al. 2003 | 1 |
| Flint 1967 | 3 | Johanson 2003 | 3 |
| Yamamoto 1967 | 5 | Prather 2003 | 3 |
| Flint 1970, 1972, 1973, 1974 | 29 | Bueno-Soria and Holzenthal 2004 | 4 |
| Flint and Bueno-Soria 1977 | 1 | Chamorro-Lacayo and Holzenthal 2004 | 1 |
| Haddock 1977 | 2 | Holzenthal and Andersen 2004 | 7 |
| Bueno-Soria and Flint 1978 | 6 | Bueno-Soria et al. 2005 | 1 |
| Flint and Bueno-Soria 1979 | 3 | Blahnik and Holzenthal 2006 | 1 |
| Bueno-Soria 1981 | 1 | Holzenthal and Blahnik 2006 | 1 |
| Flint 1981a | 2 | Johanson and Malm 2006 | 4 |
| Flint 1981b | 3 | Blahnik and Holzenthal 2008 | 8 |
| McElravy et al. 1981 | 12 | Bueno-Soria 2009 | 1 |
| Schmid 1982 | 5 | Chamorro and Holzenthal 2010 | 4 |
| Denning et al. 1983 | 3 | Oláh and Flint 2012 | 7 |
| Kelly 1983 | 1 | Blahnik and Holzenthal 2014 | 4 |
| Flint and Bueno-Soria 1987 | 2 | Bueno-Soria and Barba-Álvarez 2015 | 1 |
| Flint et al.1987 | 14 | Muñoz-Quesada and Holzenthal 2015 | 13 |
| Holzenthal 1988a, 1988b, 1988c | 3 | Rázuri-Gonzales and Holzenthal 2016 | 1 |
| Maes and Flint 1988 | 1 | Armitage et al. 2015 | 32 |
| Flint and Denning 1989a, 1989b | 9 | Harris and Armitage 2015 | 9 |
| Bueno-Soria 1990 | 5 | Armitage et al. 2016 | 42 |
| Harris 1990 | 1 | Armitage and Harris 2018a | 8 |
| Flint 1991 | 3 | Thomson and Armitage 2018 | 7 |
| Flint and Reyes 1991 | 2 | Armitage et al. 2018 | 25 |
| Blahnik and Holzenthal 1992 | 2 | Harris and Armitage 2019 | 22 |
| Flint 1992 | 1 | Razuri-Gonzales and Armitage 2019 | 3 |
| Holzenthal and Harris 1992 | 1 | Blahnik and Armitage 2019 | 8 |
| Holzenthal and Strand 1992 | 2 | Armitage et al. 2020 | 17 |
| Harris and Tiemann 1993 | 2 | Armitage and Harris 2020 | 8 |
| Blahnik 1995 | 3 | Thomson and Armitage 2021 | 11 |
| Holzetnthal 1995 | 1 | Armitage et al. 2022a | 12 |
| Flint 1996 | 5 | Armitage et al. 2022b | 12 |
| Bueno-Soria and Santiago-Fragoso 1997 | 8 | Thomson et al. 2022 | 6 |
| Muñoz-Quesada 1997 | 1 | Harris et al. 2023 | 8 |
| Blahnik 1998 | 14 | Armitage et al. 2023 | 3 |
| Flint 1998 | 7 | Harris and Armitage 2023 | 16 |
| Flint et al. 1999 | 3 | Armitage and Harris 2023 | 2 |
| Harris and Holzenthal 1999 | 2 | Blahnik et al. 2023 | 2 |
| Blahnik 2002 | 1 | Harris et al. 2024 | 17 |
| Bueno-Soria and Santiago-Fragoso 2002 | 10 | Armitage et al. 2024 | 8 |

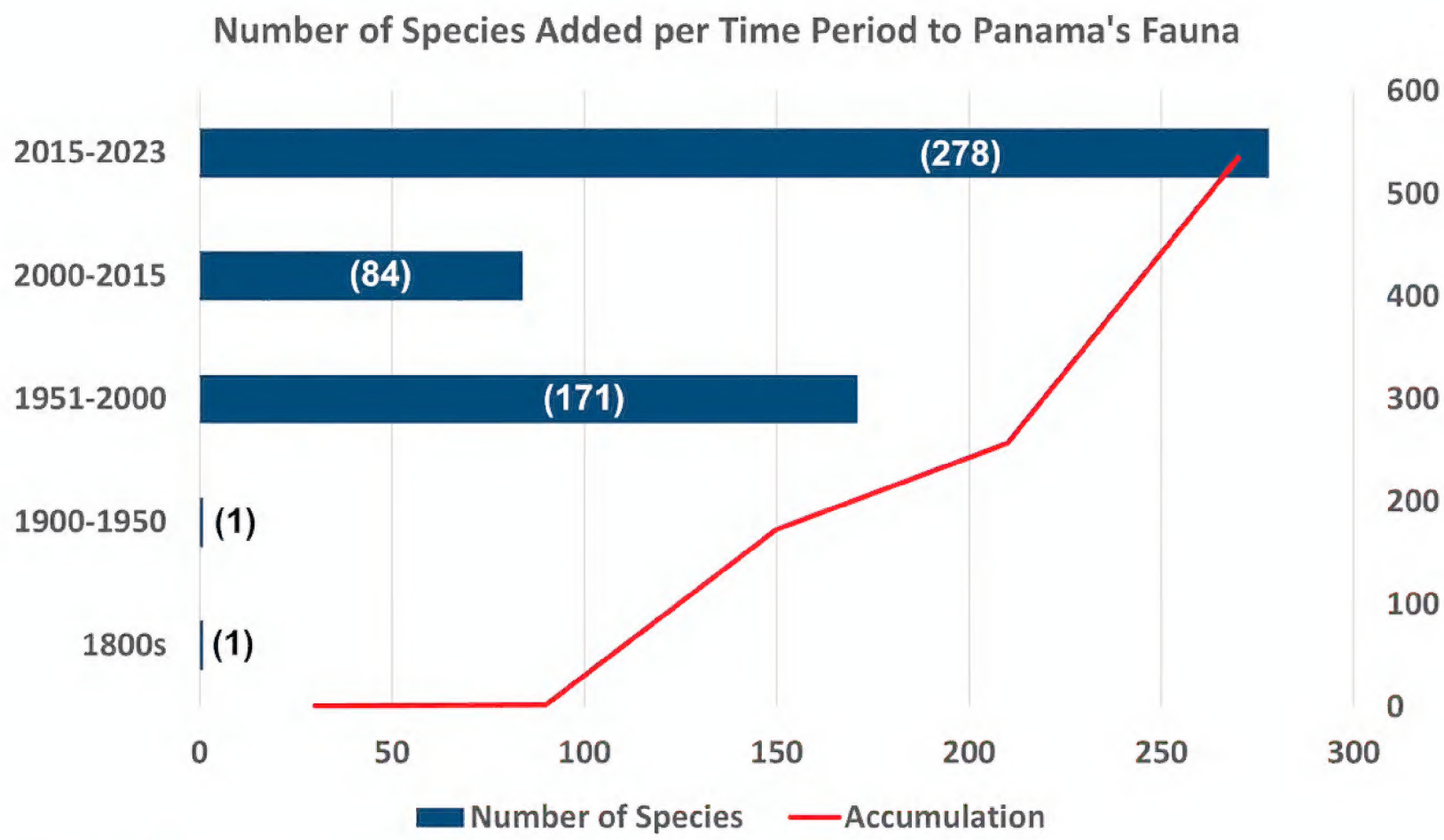


**Figure 2.** Number of species added to Panama's caddisfly fauna per time period.

## Collection localities: historical and recent

Prior to 2015, most caddisfly species were collected and recorded from a relatively small number of locations on an occasional basis and in an unorganized manner. The Panama Canal Zone (Panamá Province) was a common collecting location as was the town of Boquete near Volcán Barú in the western highlands (Chiriquí Province). Three principal collecting locations from which caddisflies were reported were established by Henry Wolda at Barro Colorado Island in the Canal Zone, Miramar in Bocas del Toro Province, and Fortuna Forest Preserve near Fortuna Reservoir and Dam (McElravy et al. 1982). Other than these three locations, no methodical collecting was conducted. Further, until 2015, few collection events occurred specifically for capture of caddisflies.

In 2015, collections were made in a more systematic manner, over extended periods of time (6–7 months minimum, December through June, or monthly for an entire year), and employing at least two different collection methods (typically UV light traps and Malaise traps, the latter when possible). The geographic extents, both in surface locations and with altitude, were also increased. Although the majority of collections have been made in western Panama for logistical reasons, more areas of Panama have been sampled during the last 8 years than during the previous 145 years by a large margin. Yet, much more remains to be done.

Collection sites for the 2015–2023 period are identified in Fig. 1B, without annotations. In Appendix 1: Table A1, we present the stream name, latitude, longitude, altitude, and Global Stream ID for each of these locations. As is true for many streams in Latin America, names are not always established or available for each one; thus, we resort to employing "Quebrada sin nombre–unnamed creek", or in the case of a stream which directly enters a larger, named stream "afluente de–tributary of" as identifiers.

## Panama's Trichoptera fauna

Herein we present an up-to-date list of the caddisflies recorded from Panama. Fig. 3 provides summary statistics for the number of genera and species in each trichopteran family. Appendix 1: Table A2 presents all of the species organized by suborder, superfamily, family and genus. The type country is included as well as the country distribution for each species. Fig. 4 summarizes the source countries of species holotypes for Panama's fauna. It is worth noting that we have collected an additional 30–40 potential new species which are awaiting further examination and/or description, but these are not included at this time.

## Geographic affinities

The number and percentage of endemics in Panama are 170 species and ~32%, respectively. Employing current published literature and recent catalogs of Neotropical Trichoptera (Holzenthal and Calor 2017) and Hydroptilidae (Thomson 2023), we present a cluster diagram derived from Jaccard similarity values (Fig. 5) reflecting the current faunal assemblage relationships between Panama and other nearby regions. Additional comment about these results can be found in the Discussion section. Fig. 6 illustrates the numbers of Panamanian species shared with these other regions. As expected, the largest number of species

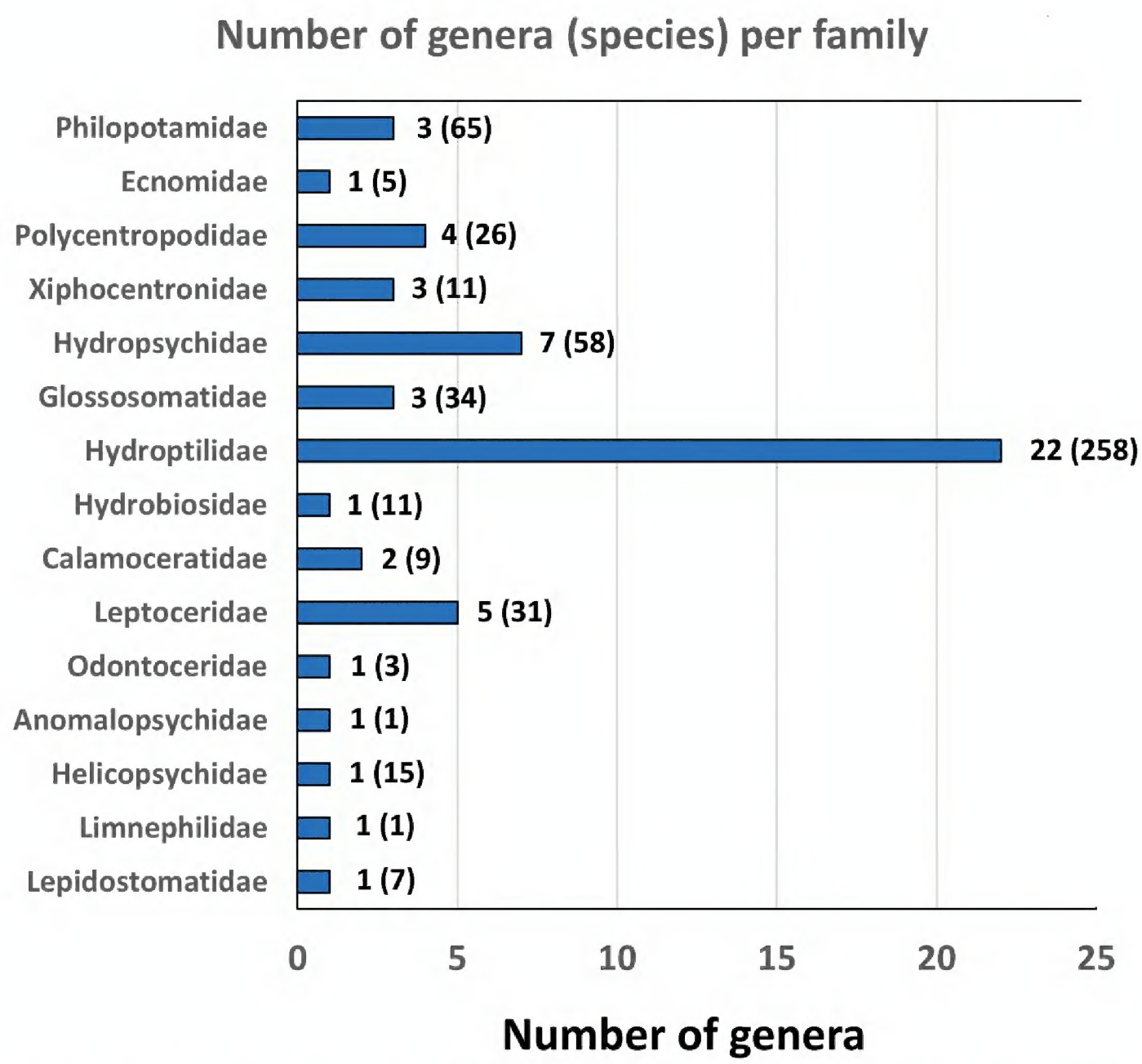


**Figure 3.** Graphical presentation of the number of genera and species (in parentheses) for each caddisfly family found in Panama.

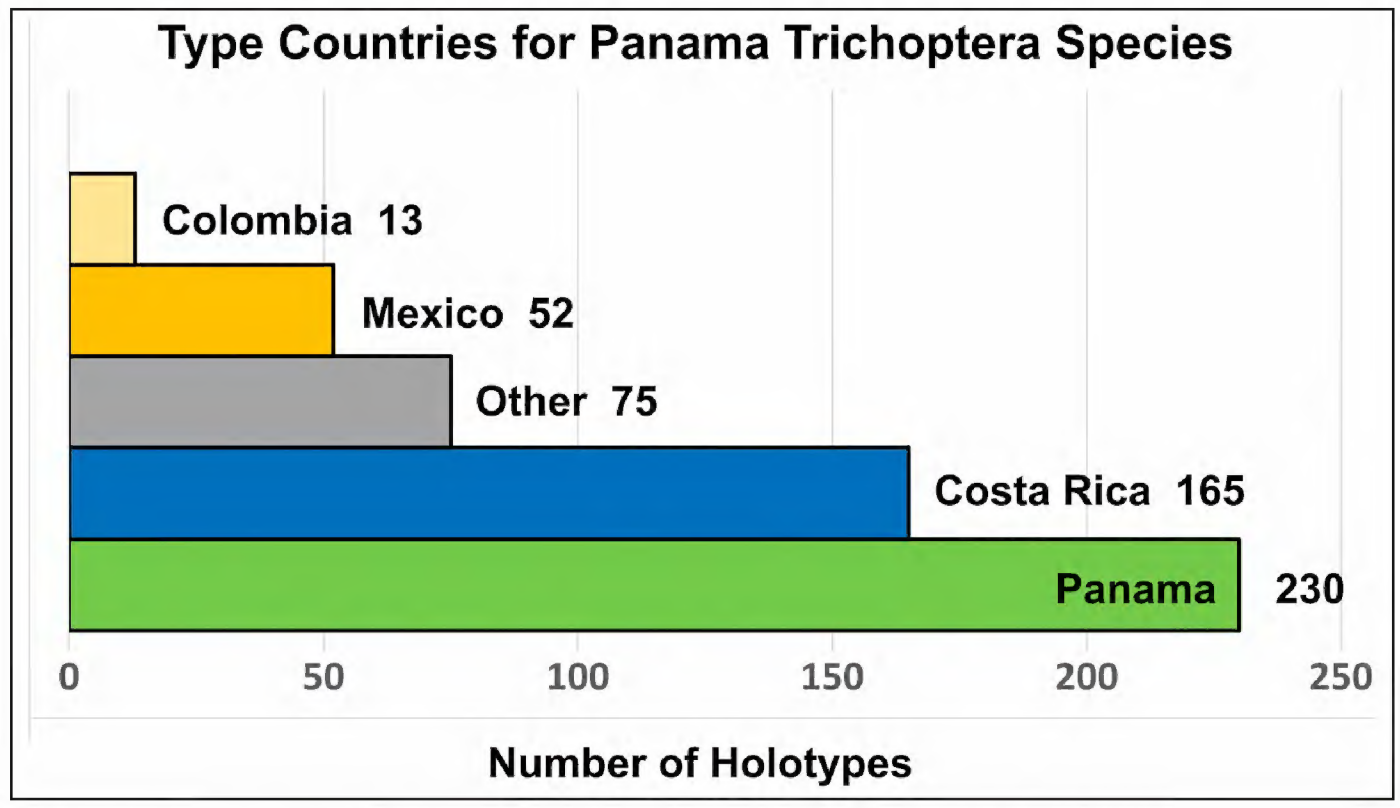


**Figure 4.** Contribution of holotypes by other countries to Panama's fauna.

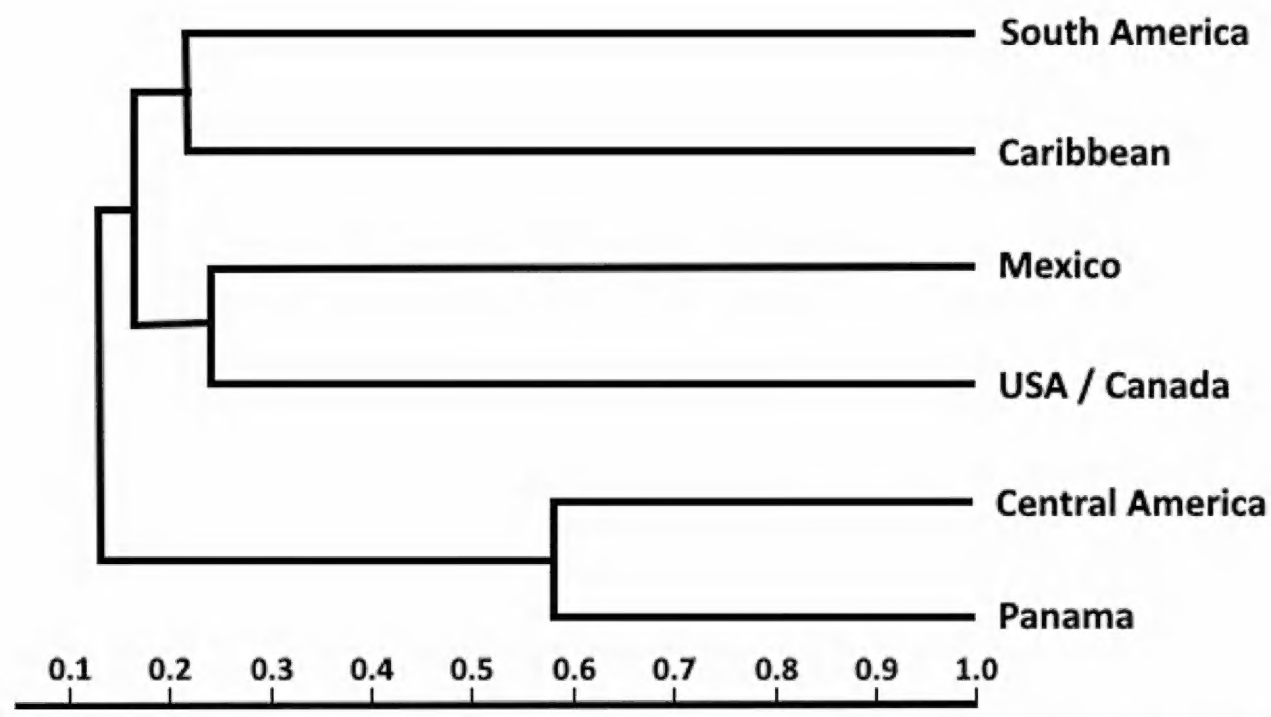


**Figure 5.** Cluster diagram for results from a Jaccard similarity matrix employing UPGMA conditions The matrix and resulting diagram used PAST 4.01 (PAleontological STatistics) software (Hammer et al. 2001).

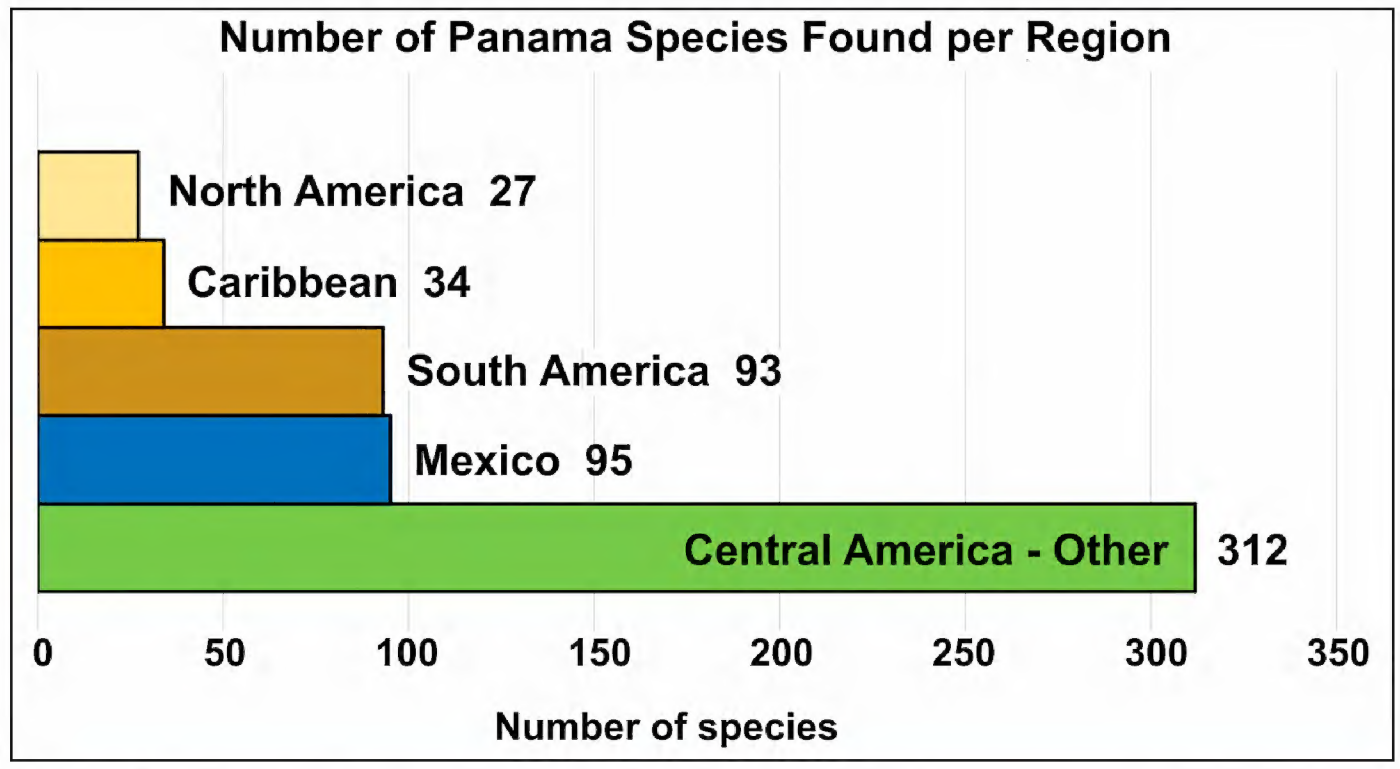


**Figure 6.** Graph showing the number of Panamanian species found in other regions.

is shared with other Central American countries (58.3%), followed by Mexico (17.8%), South America (17.4%), the Caribbean islands (6.3%), and North America (5.0%). The country of Costa Rica shares the most species with Panama (285 species, or 53.3%), with which it also has a common border to its WNW.

## Discussion

The driving justification for this third benchmark paper about Panama's Trichoptera fauna was primarily internal in origin, rather than meeting some external demand. The number of species had simply grown beyond expectations and comprehension, necessitating an update. The identification of specimens in new samples became increasingly inefficient as lists and identification aids required constant updates. Whereas we are not entirely convinced that our cognizance will change completely, even after the publication of this article, we hope for a better handle on where we are at the moment. In 2023, we conducted monthly sampling at 27 locations in western Panama over a five-month period, with nine stream locations at each of three increasing altitudes. This was our last major collecting effort for two to three years as we attempted to become more familiar with what we already know, and to completely process all of the samples we have collected in the last five years. Given the history of new records and species in each collection, this settling of accounts will surely alter our perceptions of Panama's caddisfly fauna once again. Indeed, the number of new caddisfly species and country records which have been added to the fauna of Panama over the last eight years shows no signs of decreasing. This is evidenced by the lack of a curve in Fig. 7 and Fig. 8, providing no clue as to the y-axis asymptote despite our best collecting efforts. Even when plotting the individual accumulation tracks of new country records versus new species to science for AIGR collections (Fig. 8) no significant deflection is detected. The only real change is that we are beginning to find second and third locations for some of our new species described in the 2015–2018 time period, but these are quickly replaced by new, more recent, species known from a single location.

The growth of the family Hydroptilidae has exceeded all expectations as illustrated in Table 2. Certainly, the diversity of the genus *Neotrichia* from three species in early 2015 to the current 45 species speaks to this fact. Moreover,

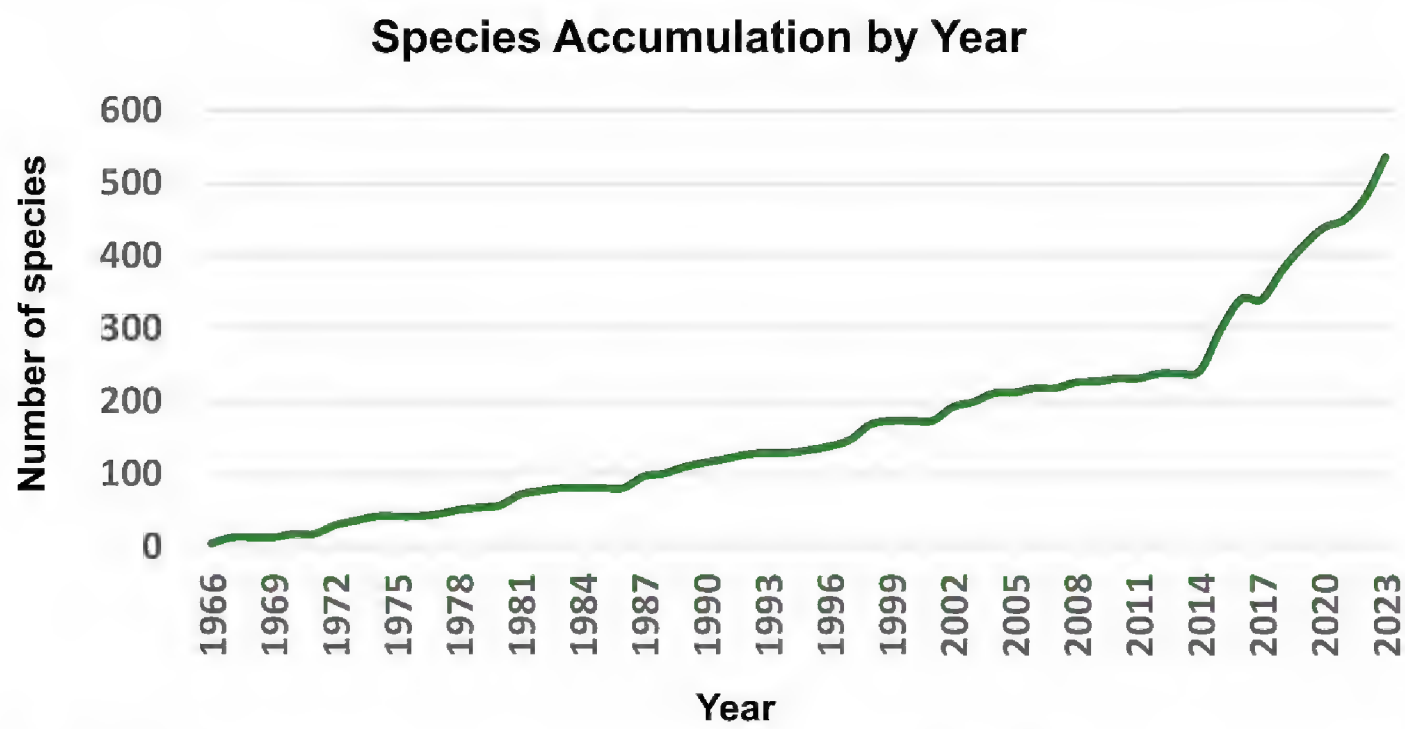


**Figure 7.** Graph displaying the accumulation of Trichoptera species found in Panama over time.

there are already additional, new *Neotrichia* species in our recent collections awaiting description. We never anticipated that a small country like Panama would exceed all other Latin American countries in the number of hydroptilids (Table 3). We do expect that other countries, like Brazil, with a large land area, highly varied topography, diverse habitats and microclimates, and an excellent

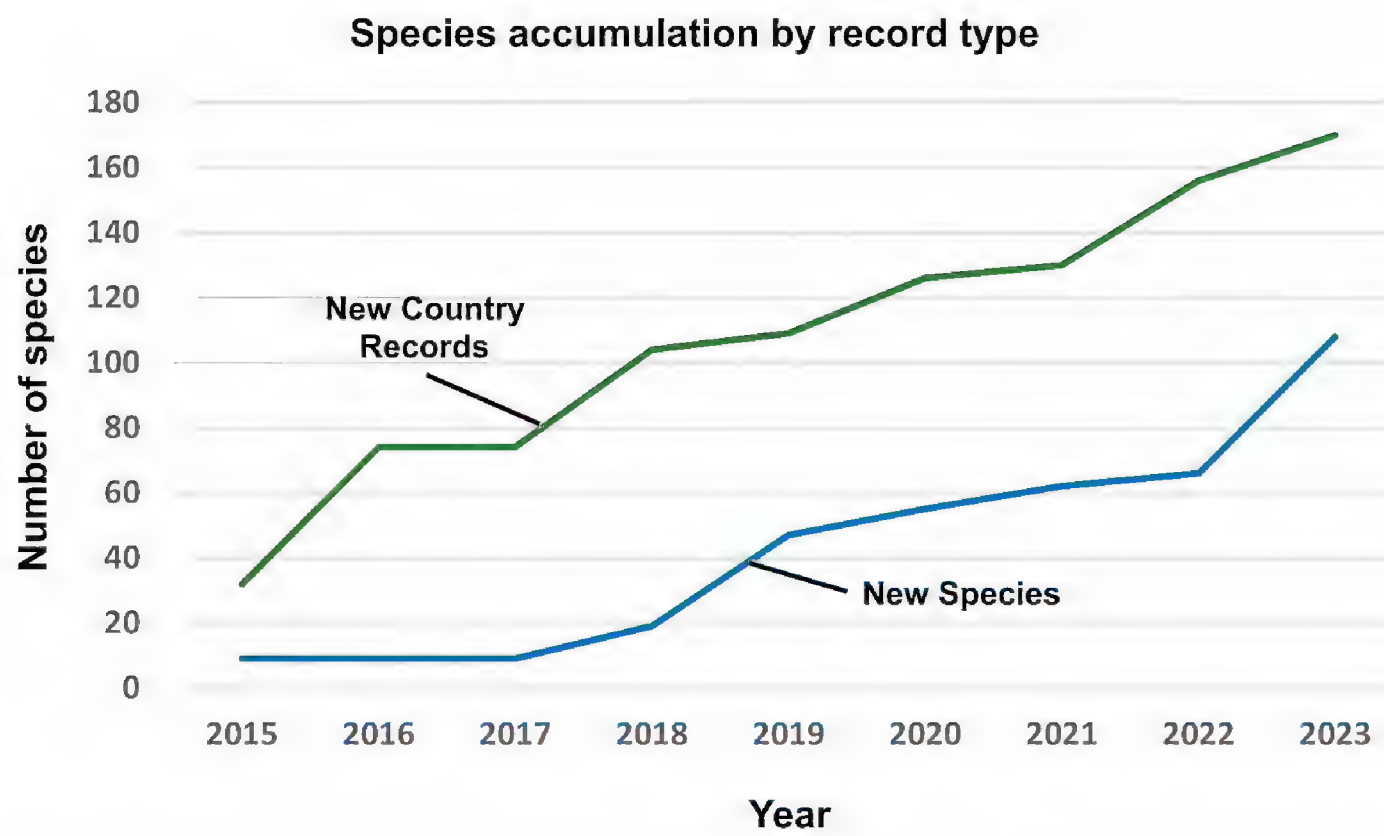


**Figure 8.** Graph displaying the accumulation of new species and new country records for AIGR samples.

**Table 2.** Examples of increases in the Trichoptera fauna of Panama since 2015.

| Family or Genus | Total before 2015 | Current Total* |
|---|---|---|
| **Hydroptilidae** | 154 | 250+ |
| ***Tizatetrichia*** | 0 | 4 |
| ***Leucotrichia*** | 3 | 15 |
| ***Neotrichia*** | 3 | 45 |

* Highest country diversity for the Neotropics.

**Table 3.** Comparison of the number of genera and species of the Hydroptilidae in select Latin American countries.

| Country | Number of Genera | Number of Species |
|---|---|---|
| **Panama** | 21 | **258** |
| **Mexico** | 18 | **189** |
| **Brazil** | 22 | **>161** |
| **Costa Rica** | 17 | **143** |
| **Colombia** | 12 | **46** |
| **Nicaragua** | 12 | **38** |
| **Guatemala** | 8 | **19** |
| **Honduras** | 8 | **15** |
| **Belize** | 4 | **11** |
| **El Salvador** | 4 | **6** |

and dedicated cadre of trichopterists, will eventually exceed Panama's wealth of hydroptilid species. But, not yet.

Of course, the main problem with comparing one country's fauna against any other country is that it requires equitability of effort. Such is not the case. This disparity in effort results from most Central American countries having no dedicated personnel working on adult Trichoptera (and many other groups of aquatic insects). This lack of similar effort creates a false picture, and results in skewed comparisons and statistics. Such is the problem with Fig. 5 above. The high similarity between Panama and Costa Rica coupled with the lack of complete inventories in other Central American countries has diminished the similarity value presented (~0.6). The real similarity between Panama and all other Central American countries is probably 0.8–0.9. Before we started our work in 2015 and thanks to the significant and dedicated efforts of Ralph Holzenthal at the University of Minnesota and his students and colleagues, Costa Rica was the best known Central American country for caddisflies. The information content from Costa Rica was equivalent to the data amassed by Joaquin Bueno-Soria and his students and colleagues in Mexico, although this latter work has had a longer history. Both are still among the leaders in Latin America. However, once the faunistics improved, Costa Rica, for example, evolved in the expected way to emphasize more studies in the ecological, biological, and environmental quality areas, expertly pioneered and expanded by individuals like Monica Springer at the University of Costa Rica. As a result, our total knowledge about this group of insects in Costa Rica far exceeds what we know in Panama and most other Latin American countries. Yet, more work still needs to be done there on the adult stages to get a more complete picture for that country. We are confident that there is little or no difference between Costa Rica and Panama, with both being exceedingly biodiverse and the faunas highly similar. Further, we believe that most Central American countries, if adequately surveyed, would have a minimum of 200–250 species recorded from each. We expect Panama, and perhaps other Central American countries, will mirror the efforts in Costa Rica as organizations such as AIRG at UNACHI and the University of Costa Rica continue to train young, dedicated scientists interested in the caddisfly faunas of the region.

The other issue, which we work on as much as possible, involves the methodological approach. Making spot collections at singular and sometimes random times simply will not yield any results upon which to build theories, make assumptions, or detect nature-derived or human-made impacts. If you want a reasonable and useful image of species assemblages at given locations or in given streams or watersheds, you must collect multiple times at each location and use multiple collection methods to do so. We have found UV light trapping and Malaise trapping in combination to be quite thorough in inventorying a species assemblage. We have yet to collect many caddisfly specimens in sweep nets, nor any species which were not also collected by the other methods.

The final issue for now, on which we have only a partial handle at the moment, involves year-to-year variation. We have sampled three streams for multiple years, and detected a few new records each year. Because the species involved were collected at low densities, we cannot say for certain whether or not the new records represent additions or replacements to the

species assemblage, or simply rare species that were previously undetected. Because of this, we currently plan to concentrate on species with higher population numbers and frequency of occurrence and employ repeated sampling over longer time frames (e.g., at three-to-five-year intervals), in order to get a better picture of actual variation, if any. This issue is important in evaluating changes due to natural (e.g., landscape succession) or other (e.g., global warming or landscape modification) perturbations on aquatic systems. If variation in mean species composition over time under normal conditions is not known, how can one detect statistical variation under non-normal (but also non-catastrophic) conditions with any confidence? It is possible that using adult aquatic insects, here Trichoptera, for environmental impact studies provides too much variation and information (=noise) to help in this regard. As has been shown in many parts of the world, use of the larval stage, currently identifiable only to the genus level, while not as informative, usually provides sufficient information to demonstrate impacts coupled with less noise. However, at this moment, use of the larval stage is not adequate to define a species assemblage, and neither has it anything intelligent to say about species diversity.

Concerning the future, based on current trends, material on-hand, some non-parametric estimators (e.g., Chao2–Chao 1984, 1987; Chao et al. 2017), and the chance for more internally trained taxonomists, we believe Panama will eventually be found to host 750–850 species of Trichoptera, most of which will be in the family Hydroptilidae. Although we published a paper earlier (Armitage and Cornejo 2015) which presented information about the distribution of Trichoptera in Panama, and have collected and accumulated even more data during the past eight years, we still do not have a very good grasp of surficial distribution. More than a few whole cuencas have never been surveyed, throughout Panama. Also, we are only beginning to get a sense of how Panama's caddisfly fauna is distributed by altitude. And, although we have published a few papers on non-taxonomic topics (e.g., Armitage and Harris 2018b, 2018c; Armitage et al. 2021), at some point we have to begin associating the adults with the immature stages and start to ask serious questions about ecology, life history, population dynamics, and the many other non-taxonomic aspects. Thus, much remains to be done to better understand this most interesting group of insects.

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## Additional information

### Conflict of interest

The authors have declared that no competing interests exist.

### Ethical statement

No ethical statement was reported.

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### Author contributions

Conceptualization: BJA. Data curation: BJA, TARG, YPA. Formal analysis: BJA, TARG, YPA, SCH, RJB, RET. Writing and editing: BJA, TAA. Funding acquisition: BJA.

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### Data availability

All of the data that support the findings of this study are available in the main text.

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# Appendix 1

**Table A1.** Waterbodies sampled during the period 2014–2023. [N/A = not available].

| Cuenca_No–Stream | Latitude, Longitude | Altitude | Stream Global ID |
|---|---|---|---|
| **Boca del Toro Province** | | | |
| 93 – afluente Quebrada Rambala | 8.91543, -82.15527 | 134 | N/A |
| 93 – Quebrada Canaza | 8.86685, -82.16688 | 300 | {B69D4FAB-CBE9-4CDB-88E2-51F4CD804FFE} |
| 93 – Quebrada Rambala | 8.91627, -82.15469 | 120 | {D7C04D47-E911-4C34-A67E-62B905C7CFA4} |
| 93 – afluente Río Guabo | 8.77781, -82.20175 | 1660 | N/A |
| 93 – Río Holcón | 8.87616, -82.48667 | 1785 | {1D26B5F6-5646-4C3E-83F2-E34366A09228} |
| **Chiriquí Province** | | | |
| 102 – afl. Río Bonita | 8.63840, -82.75732 | 590 | {0BD191BD-7BA4-46E1-9731-2696FE479E9A} |
| 102 – afluente de Río Jacu | 8.50427, -82.81274 | 70 | {91E7D743-AB73-40B9-81BB-295B77E25627} |
| 102 – afluente de Río Jacu | 8.61308, -82.74826 | 510 | {019E8F76-D705-4A26-AF9F-E8E8CB6EA6F1} |
| 102 – afluente Río Chiriquí Viejo | 8.90124, -82.61817 | 2354 | {CA463C25-4E28-46BD-9917-5E7086951F23} |
| 102 – afluente Río Chiriquí Viejo | 8.89757, -82.61631 | 2350 | N/A |
| 102 – afluente Río Chirqui Viejo | 8.89056, -82.61201 | 1996 | {7A7E3BCD-FDCE-4FBF-B479-753951CBDCE8} |
| 102 – afluente Río Colorado | 8.88472, -82.68408 | 1915 | N/A |
| 102 – Estación MiAmbiente PILA | 8.89209, -82.61682 | 2178 | {B2F7CB27-1940-4BD2-B27C-C941019608E7} |
| 102 – Quebrada Bonita | 8.49857, -82.74541 | 196 | {9157E345-74A9-4592-8C47-2826F6216A50} |
| 102 – Quebrada Brusca o Chevo | 8.83473, -82.77345 | 1139 | {2B2A87B2-3DB2-420A-94FF-8624BAFAD0F0} |
| 102 – Quebrada Brusca o Chevo | 8.84482, -82.76075 | 1505 | {2B2A87B2-3DB2-420A-94FF-8624BAFAD0F0} |
| 102 – Quebrada Caisan | 8.69663, -82.81066 | 484 | {69EEB31F-4DCA-49E7-A125-418587CB1BB6} |
| 102 – Quebrada Camaron | 8.52786, -82.69687 | 266 | {C627A745-E2EB-4DC7-9D0F-C507B7D74CFB} |
| 102 – Quebrada Cujato | 8.83395, -82.75294 | 1161 | {BC6D5816-989D-4DBB-ABE9-B023F95FF13A} |
| 102 – Quebrada Garita Final | 8.86509, -82.59568 | 1821 | {1A3D779D-A4E3-4FE4-917A-6CBDC31B4AA8} |
| 102 – Quebrada Guisado | 8.82943, -82.80455 | 945 | {196D9B62-8E4D-4BBD-888F-6C60234A6B4D} |
| 102 – Quebrada La Cruz o Coloradito | 8.81957, -82.70991 | 1260 | {1B8F76C8-6880-4883-AFFA-104842B783FE} |
| 102 – Quebrada La Vuelta | 8.61710, -82.70415 | 492 | {DC6ED8CC-71BC-42DA-827B-1DA8EB569E1F} |
| 102 – Quebrada Limón | 8.52852, -82.68256 | 269 | {03AD31B5-4EE3-47AD-9D7F-0E4B15CC10BA} |
| 102 – Quebrada Norte | 8.87361, -82.69051 | 1709 | {9DC66821-70D1-41C1-AEA7-85BFA3ECFB43} |
| 102 – Quebrada Pavón | 8.65933, -82.79304 | 440 | {B841209B-2153-4470-8A52-729B50FDDEE8} |
| 102 – Quebrada San Andrés | 8.60574, -82.73056 | 519 | {E25ED9B0-F6A0-4859-AC04-2040DFC031FA} |
| 102 – Quebrada sin nombre | 8.61765, -82.71330 | 540 | {EB8C9441-E6D4-484E-AEED-53964F569EB9} |
| 102 – Quebrada sin nombre | 8.64377, -82.82975 | 755 | {AABD7007-19B1-4BE4-B221-DD924D9527D4} |
| 102 – Quebrada sin nombre | 8.64501, -82.82204 | 575 | {AABD7007-19B1-4BE4-B221-DD924D9527D4} |
| 102 – Río Baitún | 8.65212, -82.77405 | 593 | {6A1181A6-C3E7-454A-82CA-34E5AE311B4D} |
| 102 – Río Bonita | 8.61699, -82.75993 | 496 | {6E347E2E-DD5C-463B-846E-1AE9CB251B9B} |
| 102 – Río Cana Blanca | 8.68847, -82.80431 | 478 | {47C0A215-3FB3-4A34-82DC-C2799CC2E053} |
| 102 – Río Candela | 8.82356, -82.84113 | 886 | {3A4971B7-899F-44DF-BEBC-D0646AB486D1} |
| 102 – Río Candela | 8.89968, -82.73786 | 1728 | {3A4971B7-899F-44DF-BEBC-D0646AB486D1} |
| 102 – Río Candela | 8.90614, -82.72882 | 1799 | {3A4971B7-899F-44DF-BEBC-D0646AB486D1} |
| 102 – Río Candela | 8.91040, -82.72054 | 1957 | {3A4971B7-899F-44DF-BEBC-D0646AB486D1} |
| 102 – Río Chiriquí Viejo | 8.53097, -82.83264 | 97 | {701875AA-B529-4B32-AC05-1BBDBE2490B1} |
| 102 – Río Chiriquí Viejo | 8.80577, -82.66640 | 1309 | {701875AA-B529-4B32-AC05-1BBDBE2490B1} |
| 102 – Río Chiriquí Viejo | 8.87550, -82.55336 | 2117 | {701875AA-B529-4B32-AC05-1BBDBE2490B1} |
| 102 – Río Chiriquí Viejo | 8.86589, -82.58783 | 1829 | {701875AA-B529-4B32-AC05-1BBDBE2490B1} |
| 102 – Río Colorado | 8.83158, -82.71716 | 1215 | {CDBBC16D-036A-40AA-97C3-F91C507AFC1B} |
| 102 – Río Colorado | 8.87356, -82.68999 | 1700 | {CDBBC16D-036A-40AA-97C3-F91C507AFC1B} |
| 102 – Río Cotito | 8.83091, -82.73647 | 1166 | {E4D964B4-8C05-4205-9C3E-516829CD8592} |
| 102 – Río Divalá | 8.52909, -82.69150 | 258 | {FB980922-B4F3-4558-935D-2F81CEE78AB9} |

| Cuenca_No–Stream | Latitude, Longitude | Altitude | Stream Global ID |
|---|---|---|---|
| 102 – Río Gariché | 8.48812, -82.77207 | 70 | {195EBEFC-FCBA-4393-ADC6-0C0D4FE8D69F} |
| 102 – Río Gariché | 8.75566, -82.65355 | 1319 | {195EBEFC-FCBA-4393-ADC6-0C0D4FE8D69F} |
| 102 – Río Jacú | 8.49496, -82.80673 | 51 | {890004D7-41EB-4359-92C8-A32C600BCF62} |
| 102 – Río Jacú | 8.60904, -82.73784 | 498 | {890004D7-41EB-4359-92C8-A32C600BCF62} |
| 102 – Río Los Pozos | 8.87074, -82.69101 | 1674 | {2B052C02-BA04-4055-87B4-553DD7D48361} |
| 104 – Río Güigala | 8.51845, -82.64280 | 209 | {53F211E0-43D0-4532-9615-F004504B89B6} |
| 106 – Quebrada Balsa | 8.54526, -82.55153 | 326 | {045573F5-A75E-487C-B89A-7CE97C796ACA} |
| 106 – Río Brazo Prieto | 8.65689, -82.56153 | 797 | {704F0378-CC5F-4901-A3C9-84B63004C39E} |
| 106 – Río Chirigagua | 8.48139, -82.54788 | 128 | {D46D4A8D-05E9-4B8C-A34A-576C185D7B22} |
| 106 – Río Chirigagua | 8.64200, -82.55780 | 737 | {D46D4A8D-05E9-4B8C-A34A-576C185D7B22} |
| 108 – afluente Quebrada Grande | 8.78291, -82.44579 | 1253 | {A250508F-0B9E-4919-99C3-510BA9259FA6} |
| 108 – afluente Quebrada Jaramillo | 8.76667, -82.42256 | 1200 | {98F1C498-4400-47C9-825F-E7BD2B4DA621} |
| 108 – afluente Quebrada Jaramillo | 8.76671, -82.41519 | 1300 | {382A9959-39AF-4254-B36C-C97D5A0A17EC} |
| 108 – afluente Quebrada Jaramillo | 8.76671, -82.41341 | 1282 | {0B23E403-F436-4D7B-B7C8-DECE0179324B} |
| 108 – afluente Río Chiriquí | 8.77757, -82.19464 | 1660 | N/A |
| 108 – afluente Río La Cruz | 8.70985, -82.47848 | 925 | {A2D1F6B5-0DE6-4CBA-86D5-34656D07A146} |
| 108 – Afluente Río Palo Alto | 8.80949, -82.39575 | 1673 | {BB40288F-B07D-498C-BFFD-99FA7932FF8C} |
| 108 – afluente Río Platanal | 8.65452, -82.54255 | 825 | {92265D9E-4C7B-4590-B07F-621B14A93AAB} |
| 108 – Primer Brazo del Río David | 8.64414, -82.49408 | 696 | {439CB133-D9E2-4AF5-9B54-8571F0AD0297} |
| 108 – Quebrada Aserrío | 8.79416, -82.44620 | 1117 | {954126B5-626A-4D31-8E75-9B1D92F7403E} |
| 108 – Quebrada Aserrío | 8.79472, -82.44968 | 1157 | {954126B5-626A-4D31-8E75-9B1D92F7403E} |
| 108 – Quebrada Becuel | 8.84570, -82.49097 | 1801 | N/A |
| 108 – Quebrada Cenizas | 8.80105, -82.45608 | 1348 | {F926E222-C241-4BCF-A06D-A6EFF09893E2} |
| 108 – Quebrada Cheche | 8.76892, -82.43338 | 1008 | {12FC2E17-130C-441E-8999-CD9C3C16B18E} |
| 108 – Quebrada de Frank | 8.74847, -82.21788 | 1660 | {0C0B87AE-3261-4CA2-9C62-284160C66D34} |
| 108 – Quebrada del Guayabo | 8.84939, -82.49349 | 1947 | {6B7B49AC-4FDB-469F-9B21-EC95D649B394} |
| 108 – Quebrada El Velo | 8.82042, -82.48428 | 1782 | {78590031-39EC-46E7-A6E4-E47E774ACCEA} |
| 108 – Quebrada Grande | 8.77195, -82.43308 | 1200 | {02AB639E-70C6-4C5E-B74D-122B4183976C} |
| 108 – Quebrada Grande | 8.47944, -82.30944 | 70 | {B0D87B6D-3A72-4E81-9EEC-86A1B0B7F7C6} |
| 108 – Quebrada Grande | 8.77970, -82.44016 | 1122 | {02AB639E-70C6-4C5E-B74D-122B4183976C} |
| 108 – Quebrada Honda | 8.74985, -82.23885 | 1132 | {1C1B38EB-387B-4A7D-98A8-B604148BA17C} |
| 108 – Quebrada Jaramillo | 8.75454, -82.41848 | 1075 | {98F1C498-4400-47C9-825F-E7BD2B4DA621} |
| 108 – Quebrada Jaramillo | 8.76320, -82.41383 | 1259 | {98F1C498-4400-47C9-825F-E7BD2B4DA621} |
| 108 – Quebrada Jaramillo | 8.77427, -82.40699 | 1470 | {98F1C498-4400-47C9-825F-E7BD2B4DA621} |
| 108 – Quebrada Jaramillo Abajo | 8.74600, -82.41804 | 1060 | {C2E9B1E4-499E-41A6-8AD1-13993264A576} |
| 108 – Quebrada San Cristóbal (cerca) | 8.43298, -82.45229 | 31 | {73D75F47-340A-4C0F-B3FE-9A58C9A2A6E0} |
| 108 – Quebrada San Cristóbal (cerca) | 8.43406, -82.45193 | 45 | {73D75F47-340A-4C0F-B3FE-9A58C9A2A6E0} |
| 108 – Quebrada sin nombre | 8.82786, -82.49534 | 1765 | {ACDE5256-98F5-42EE-B720-D8DBE9BD0ADB} |
| 108 – Quebrada sin nombre | 8.84523, -82.48599 | 1804 | N/A |
| 108 – Río Caldera | 8.74228, -82.42160 | 1000 | {720DAACB-8139-455C-BAB0-96047558D084} |
| 108 – Río Caldera | 8.78361, -82.43014 | 1109 | {720DAACB-8139-455C-BAB0-96047558D084} |
| 108 – Río La Cruz | 8.70268, -82.48445 | 935 | {2C6AE4FE-7C64-4512-B1A9-6880385397C2} |
| 108 – Río Majagua | 8.66138, -82.52639 | 837 | {D54AFBBC-7F2E-4E01-BF48-2AB566B2D7E4} |
| 108 – Río Majagua | 8.66172, -82.53818 | 877 | {D54AFBBC-7F2E-4E01-BF48-2AB566B2D7E4} |
| 108 – Río Majagua | 8.68093, -82.53276 | 840 | {D54AFBBC-7F2E-4E01-BF48-2AB566B2D7E4} |
| 108 – Río Palo Alto | 8.80266, -82.42245 | 1673 | {2CE456A4-7D2C-4625-B1BF-784DC76693A7} |
| 108 – Río Papayal | 8.45735, -82.34091 | 59 | {DF6B5980-5CA5-474C-AC3B-7BE9740846F0} |
| 108 – Río Platanal | 8.46416, -82.52030 | 84 | {67058F6C-6B31-484C-BE4A-D4966951B097} |
| **Coclé Province** | | | |
| 105 – afluente Quebrada Corazones | 8.67801, -80.60006 | 792 | N/A |
| 105 – Quebrada Corazones | 8.67760, -80.60007 | 728 | N/A |
| 134 – afluente Las Yayas | 8.66307, -80.58908 | 709.4 | N/A |

| Cuenca_No–Stream | Latitude, Longitude | Altitude | Stream Global ID |
|---|---|---|---|
| 134 – Quebrada La Máquina | 8.65800, -80.58845 | 612 | N/A |
| 134 – Quebrada La Yayas | 8.66168, -80.59522 | 602 | {B8AE7229-EA0F-4499-BDB6-DD9BE7B4DEDE} |
| 134 – Río Marica | 8.55016, -80.23631 | 215 | {B7EAA4A9-0A62-4898-BB66-87CB80C93BC8} |
| 134 – Río Membrillo | 8.58450, -80.22074 | 334 | {CA3E47CD-E996-47F4-8814-4A47955D9780} |
| 134 – Río Salado | 8.59580, -80.21512 | 323 | {D1D97416-E116-4252-ABF0-7C8A2EF139FE} |
| 134 – Río Seren | 8.58983, -80.21476 | 332 | {10C1B276-8E77-4C3F-BA41-8E69558CF41B} |
| **Colón Province** | | | |
| 115 – Río Seda | 9.15505, -79.73793 | 92 | {77FD688A-FC85-4FC8-A69A-F3EA9DE3AD73} |
| 117 – Quebrada Agua Caliente | 9.49961, -79.64887 | 79 | {8CEC5B18-9761-48F4-B784-F5333A761BEA} |
| 117 – Quebrada sin nombre | 9.60069, -79.61658 | 55 | {7961F346-FDF6-4393-998A-29BDB4A36375} |
| **Darién Province** | | | |
| 152 – Quebrada sin nombre | 8.79472, -78.45386 | 879 | N/A |
| 156 – Río Pirre | 8.01732, -77.72417 | 150 | {0D3856E1-E154-41C9-87EC-D4AB7E63C5B5} |
| 156 – Río Pirre | 8.09081, -77.74043 | 73 | {0D3856E1-E154-41C9-87EC-D4AB7E63C5B5} |
| **Herrera Province** | | | |
| 128 – Río La Villa | 7.73022, -80.80142 | 605 | {4704EC03-15C7-4A1E-B23A-900882F3E176} |
| 128 – Río La Villa | 7.73296, -80.79987 | 590 | {4704EC03-15C7-4A1E-B23A-900882F3E176} |
| **Ngäbe-Buglé Comarca** | | | |
| 93 – afluente Río Guabito | 8.81721, -82.19754 | 757 | N/A |
| 93 – afluente Río Guabo | 8.77804, -82.19063 | 1660 | N/A |
| 93 – Quebrada Cabello de Angel | 8.78243, -82.19276 | 754 | {8CA4BFC4-6DD6-4F06-B6B4-BC32B9987153} |
| 93 – Quebrada los Novios | 8.79656, -82.19635 | 515 | N/A |
| 93 – Quebrada Martínez | 8.79361, -82.19392 | 538 | {416AF012-81C0-4406-8789-81B7A60FB72D} |
| 93 – Quebrada Martínez | 8.79484, -82.19047 | 480 | {416AF012-81C0-4406-8789-81B7A60FB72D} |
| 93 – Río Guabo | 8.84437, -82.18289 | 118 | {3AA15818-A345-4D23-9118-3B690E77CD03} |
| 108 – afluente Quebrada Arenal | 8.77650, -82.20897 | 1044 | {B1B39EAE-2BCB-4821-AD3C-76DB5013C4A8} |
| **Panama Oeste Province** | | | |
| 115 – Río Cacaito | 8.71650, -80.00740 | 497 | {2813676B-C416-4934-B597-5E1FFBA9FF1D} |
| 115 – Río Trinidad | 8.73115, -79.98481 | 232 | {06D73CFC-102D-44CC-B145-1EBAA3C1E956} |
| 138 – Quebrada Anguillosa | 8.68724, -79.92549 | 754 | {B9EF3532-E694-46FF-93EE-79D54E0ECA16} |
| 138 – Río Sajalices | 8.67625, -79.89748 | 194 | {5E814F25-0C95-48C7-B2D7-BB222DE32336} |
| **Veraguas Province** | | | |
| 97 – afluente Río Calovébora | 8.55038, -81.16486 | 515 | {1EDD9F83-293A-41E2-B889-D41D3BDB14E8} |
| 97 – Quebrada sin nombre | 8.55343, -81.17675 | 395 | {1F634B75-0354-4AB5-BD45-7761303176C5} |
| 97 – Río Calovébora | 8.54318, -81.16398 | 536 | {CFC13BF5-44D2-4F2D-988A-F6D42CE6098E} |
| 97 – Río Piedra de Moler | 8.56553, -81.18817 | 340 | {110E94FD-4FC3-428F-99AF-48FA70BC6175} |
| 116 – Isla Canales de Afuera | 7.69494, -81.62649 | 29 | N/A |
| 116 – Quebrada del Rosario | 7.85826, -81.55764 | 26 | {CADE0116-0DC0-405E-AC36-05CACF7539F2} |
| 116 – Quebrada del Rosario | 7.87372, -81.49994 | 57 | {36D29AE8-9F3E-4DF8-856A-98AEB9102437} |
| 116 – Quebrada La Mina | 7.87443, -81.51004 | 63 | {45F6981C-6837-4B3A-B32D-BFA9ACD33EDB} |
| 116 – Quebrada Monita | 7.81480, -81.55724 | 26 | {32D01E8A-D0C7-4F7D-93BF-B5671C71ABF5} |
| 116 – Río Pixvae | 7.84287, -81.56329 | 17 | {35498767-3F18-4328-A63B-21CDA3D15147} |
| 122 – Río Playita | 7.34859, -80.78694 | 109 | {305E1EC9-6D5E-4098-A084-EB7829D439A0} |
| 132 – Lago cabaña Alto de Piedra | 8.51423, -81.11679 | 859 | N/A |
| 132 – Quebrada Mulabá | 8.52577, -81.13045 | 623 | {E0F81946-2AE5-4E70-BF2B-A28DC647309E} |
| 132 – Quebrada Mulabá - Isleta | 8.54513, -81.11970 | 412 | {E0F81946-2AE5-4E70-BF2B-A28DC647309E} |
| 132 – Quebrada Mulabá 2doBrazo | 8.52906, -81.13943 | 662 | {69AD297D-18C8-4944-835E-53D73A1C10F2} |
| 132 – Quebrada Mulabá 3erBrazo | 8.53143, -81.14975 | 746 | {47ADB5EA-AA64-4F0E-9E51-189CD94319E9} |
| 132 – Quebrada Mulabá-1er Brazo | 8.52560, -81.12956 | 623 | {6C721564-2100-4FD4-9528-B3D9DF3F5752} |
| 132 – Quebrada Mulabá-1er Brazo | 8.51706, -81.12140 | 770 | {6C721564-2100-4FD4-9528-B3D9DF3F5752} |
| 132 – Río Beteguí | 8.36047, -80.99481 | 144 | {5B09911B-8A39-4D51-8F72-74D2A38A3593} |
| – Quebrada sin nombre | 9.10195, -81.56155 | 14 | N/A |

**Table A2.** Taxonomic listing, type country, and distribution of Trichoptera in Panama.

| Species [Type Country] | Distribution |
|---|---|
| **Suborder Annulipalpia Martynov** | |
| **Superfamily Philopotamoidea Stephens** | |
| **Family Philopotamidae Stephens** | |
| *Chimarra* (*C.*) *adelphe* Blahnik, 1998 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarra* (*C.*) *altmani* Blahnik, 1998 [Panama] | Panama |
| *Chimarra* (*C.*) *angustipennis* Banks, 1903 [U.S.A.] | Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, U.S.A., Venezuela |
| *Chimarra* (*C.*) *caribea* Flint, 1968 [Grenada] | Grenada, St. Vincent (Mustique), Nicaragua, Panama, Suriname, Trinidad, Venezuela (Isla Margarita) |
| *Chimarra* (*C.*) *cascada* Blahnik, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *colmillo* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *dentosa* Ross, 1948 [Mexico] | Costa Rica, Guatemala, Mexico, Nicaragua, Panama |
| *Chimarra* (*C.*) *dolabrifera* Flint & Reyes, 1991 [Ecuador] | Colombia, Ecuador, Panama, Peru |
| *Chimarra* (*C.*) *duckworthi* Flint, 1967 [Costa Rica] | Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Venezuela |
| *Chimarra* (*C.*) *dudosa* Blahnik, 1998 [Panama] | Panama |
| *Chimarra* (*C.*) *emima* Ross, 1959 [Panama] | Colombia, Costa Rica, Ecuador, Nicaragua, Panama, Peru, Venezuela |
| *Chimarra* (*C.*) *flinti* Bueno-Soria, 1985 [Mexico] | Belize, Brazil, Colombia, Costa Rica, Honduras, Mexico, Nicaragua, Panama, Tobago, Trinidad, Venezuela |
| *Chimarra* (*C.*) *jemima* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *limon* Blahnik, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *longiterga* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Ecuador, Panama |
| *Chimarra* (*C.*) *munozi* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *paraortiziana* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarra* (*C.*) *peineta* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Ecuador, Nicaragua, Panama |
| *Chimarra* (*C.*) *pollex* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarra* (*C.*) *spangleri* Bueno-Soria, 1985 [Costa Rica] | Costa Rica, Panama, Trinidad |
| *Chimarra* (*C.*) *tapanti* Blahnik, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*C.*) *villalobosi* Bueno-Soria, 1985 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarra* (*C.*) *woldai* Blahnik, 1998 [Panama] | Panama |
| *Chimarra* (*C.*) *xus* Blahnik, 1998 [Ecuador] | Colombia, Ecuador, Panama |
| *Chimarra* (*Curgia*) *aureopunctata* Flint, 1967 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *banksi* (Ulmer, 1907) [Nicaragua] | Costa Rica, Honduras, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *barrettae* (Banks, 1900) [Mexico] | Costa Rica, Guatemala, Mexico, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *bisectilis* Flint, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*Curgia*) *centralis* Ross, 1959 [Panama] | Costa Rica, Ecuador, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *costaricensis* Flint, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*Curgia*) *didyma* Flint, 1998 [Panama] | Ecuador, Panama, Venezuela |
| *Chimarra* (*Curgia*) *lobata* Flint, 1967 [Panama] | Panama |
| *Chimarra* (*Curgia*) *martiza* Flint, 1998 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*Curgia*) *pablito* Flint, 1998 [Costa Rica] | Costa Rica, Ecuador, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *persimilis* Banks, 1920 [Ecuador] | Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Peru |
| *Chimarra* (*Curgia*) *purisca* Flint, 1998 [Costa Rica] | Costa Rica, Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Chimarra* (*Curgia*) *sarophora* Flint, 1998 [Panama] | Nicaragua, Panama |
| *Chimarra* (*Curgia*) *spatulata* Ross, 1959 [Mexico] | Costa Rica, Mexico, Nicaragua, Panama |
| *Chimarra* (*Curgia*) *wilsoni* Flint, 1967 [Costa Rica] | Costa Rica, Panama |
| *Chimarra* (*Otarrha*) *rossi* Bueno-Soria, 1985 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Chimarrhodella costaricensis* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Panama |
| *Chimarrhodella tapanti* Blahnik & Holzenthal, 1992 [Costa Rica] | Costa Rica, Panama |
| *Chimarrhodella ulmeri* (Ross, 1956) [Peru] | Bolivia, Colombia, Costa Rica, Ecuador, Panama, Peru, Venezuela |
| *Wormaldia anhelitus* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Guatemala, Nicaragua, Panama |
| *Wormaldia bolivari* Muñoz-Quesada & Holzenthal, 2015 [Venezuela] | Panama, Venezuela |
| *Wormaldia buenorum* Muñoz-Quesada & Holzenthal, 2015 [Mexico] | Mexico, Panama |
| *Wormaldia chrismark* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia contrerasi* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia eberhardi* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia flinti* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Bolivia, Panama |
| *Wormaldia francovilla* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia fredycarol* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia gallardoi* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia hedamafera* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Wormaldia imberti* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia lauglo* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia machadorum* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia monsonorum* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia paprockevi* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia planae* Ross & King, 1956 (in Ross, 1956) [Mexico] | Brazil, Colombia, Costa Rica, Dominica, Ecuador, Grenada, Guatemala, Guyana, Martinique, Mexico, Nicaragua, Panama, St. Vincent, Tobago, Trinidad, Venezuela, U.S.A. |
| *Wormaldia saboriorum* Muñoz-Quesada & Holzenthal, 2015 [Panama] | Panama |
| *Wormaldia tocajoma* Munoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia trondi* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Wormaldia zunigae* Muñoz-Quesada & Holzenthal, 2015 [Colombia] | Colombia, Panama |
| *Wormaldia zunigarceorum* Muñoz-Quesada & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| **Superfamily Psychomyioidea Walker** | |
| **Family Ecnomidae Ulmer** | |
| *Austrotinodes contubernalis* Flint & Denning, 1989 [Panama] | Costa Rica, Panama |
| *Austrotinodes doublesi* Muñoz & Holzenthal, 1993 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Austrotinodes fortunata* Flint & Denning, 1989 [Panama] | Panama |
| *Austrotinodes panamensis* Flint, 1973 [Panama] | Costa Rica, Nicaragua, Panama |
| *Austrotinodes sedmani* Flint, 1973 [Guatemala] | Belize, Costa Rica, Guatemala, Panama |

| Species [Type Country] | Distribution |
|---|---|
| **Family Polycentropodidae Ulmer** | |
| *Cernotina taeniata* Ross, 1952 [Mexico] | Costa Rica, Guatemala, Mexico, Nicaragua, Panama |
| *Cernotina uncifera* Ross, 1951 [Mexico] | Mexico, Nicaragua, Panama |
| *Cyrnellus fraternus* (Banks, 1905) [U.S.A.] | Argentina, Brazil, Costa Rica, Ecuador, El Salvador, Mexico, Nicaragua, Panama, Paraguay, Suriname, Uruguay, U.S.A., Venezuela |
| *Polycentropus acanthogaster* Flint, 1981 [Panama] | Panama |
| *Polycentropus altmani* Yamamoto, 1967 [Panama] | Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Tobago, Trinidad, Venezuela |
| *Polycentropus dentoides* Yamamoto, 1967 [Panama] | Costa Rica, Panama |
| *Polycentropus digitus* Yamamoto, 1967 [Panama] | Costa Rica, Panama |
| *Polycentropus fasthi* Holzenthal & Hamilton, 1988 [Costa Rica] | Costa Rica, Panama |
| *Polycentropus fortunus* Flint, 1981 [Panama] | Costa Rica, Panama |
| *Polycentropus lingulatus* Flint, 1981 [Panama] | Panama |
| *Polycentropus nebulosus* Holzenthal & Hamilton, 1988 [Costa Rica] | Costa Rica, Panama |
| *Polycentropus spicatus* Yamamoto, 1967 [Costa Rica] | Costa Rica, Panama |
| *Polyplectropus bravoae* Bueno-Soria, 1990 [Costa Rica] | Costa Rica, Panama |
| *Polyplectropus charlesi* (Ross, 1941) [U.S.A.] | Mexico, Nicaragua, Panama, U.S.A. |
| *Polyplectropus clauseni* Chamorro-Lacayo & Holzenthal, 2004 [Costa Rica] | Costa Rica, Panama |
| *Polyplectropus deltoides* (Yamamoto, 1967) [Panama] | Costa Rica, Panama |
| *Polyplectropus denticulus* Bueno-Soria, 1990 [Costa Rica] | Costa Rica, Mexico, Nicaragua, Panama |
| *Polyplectropus exilis* Chamorro-Lacayo & Holzenthal, 2004 [Costa Rica] | Costa Rica, Panama |
| *Polyplectropus insularis* Chamorro & Holzenthal, 2010 [Panama] | Panama |
| *Polyplectropus laminatus* (Yamamoto, 1966) [Ecuador] | Colombia, Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Venezuela |
| *Polyplectropus maesi* Chamorro-Lacayo, 2003 [Nicaragua] | Nicaragua, Panama |
| *Polyplectropus mathisi* Bueno-Soria, 1990 [Panama] | Panama |
| *Polyplectropus panamensis* Bueno-Soria, 1990 [Panama] | Costa Rica, Panama |
| *Polyplectropus santiago* (Ross, 1947) [Mexico] | Costa Rica, Honduras, Mexico, Nicaragua, Panama, U.S.A. |
| *Polyplectropus woldai* Chamorro & Holzenthal, 2010 [Panama] | Panama |
| *Polyplectropus yolandae* Chamorro-Lacayo & Holzenthal, 2004 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| **Family Xiphocentronidae Ross** | |
| *Cnodocentron* (*Caenocentron*) *galesus* Schmid, 1982 [Costa Rica] | Costa Rica, Panama |
| *Cnodocentron* (*Caenocentron*) *immaculata* Flint, 1991 [Colombia] | Colombia, Panama |
| *Cnodocentron* (*Caenocentron*) *lausus* Schmid, 1982 [Nicaragua] | Nicaragua, Panama |
| *Cnodocentron* (*Caenocentron*) *pallas* Schmid, 1982 [Panama] | Panama |
| *Machairocentron ascanius* Schmid, 1982 [Panama] | Panama |
| *Machairocentron teucrus* Schmid, 1982 [Panama] | Panama |
| *Xiphocentron* (*Antillotrichia*) *insulare* (Ulmer, 1913) [Trinidad] | Panama, Trinidad |
| *Xiphocentron* (*Glyphocentron*) *alcmeon* Schmid, 1982 [Guatemala] | Guatemala, Panama |
| *Xiphocentron* (*Sphagocentron*) *evandrus* Schmid, 1982 [Costa Rica] | Costa Rica, Panama |
| *Xiphocentron* (*Sphagocentron*) *julus* Schmid, 1982 [Mexico] | Mexico, Panama |
| *Xiphocentron* (*Xiphocentron*) *aureum* Flint, 1967 [Mexico] | Mexico, Panama |
| **Superfamily Hydropsychoidea Curtis** | |
| **Family Hydropsychidae Curtis** | |
| *Calosopsyche ardisia* Flint & Bueno-Soria, 1987 [Costa Rica] | Costa Rica, Panama |
| *Calosopsyche bicuspis* Flint & Bueno-Soria, 1987 [Costa Rica] | Costa Rica, Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Calosopsyche continentalis* Flint & Bueno-Soria, 1987 [Panama] | Costa Rica, Panama |
| *Calosopsyche elachista* Flint & Bueno-Soria, 1987 [Panama] | Costa Rica, Panama |
| *Calosopsyche sandrae* Flint, 1967 [Costa Rica] | Costa Rica, Panama |
| *Centromacronema apicale* (Walker, 1852) [Venezuela] | Colombia, Costa Rica, Panama, Peru, Venezuela |
| *Centromacronema auripenne* (Rambur, 1842) [Brazil] | Bolivia, Brazil, Colombia, Costa Rica, El Salvador, French Guiana, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, Venezuela |
| *Centromacronema pygmaeum* Botosaneanu, 1993 [Trinidad] | Panama, Trinidad, Venezuela |
| *Leptonema albovirens* (Walker, 1852) [Venezuela] | Belize, Colombia, Costa Rica, Grenada, Guatemala, Honduras, Mexico, Nicaragua, Panama, St. Vincent, Tobago, Trinidad, U.S.A., Venezuela |
| *Leptonema campanum* Flint, McAlpine & Ross, 1987 [Panama] | Costa Rica, Panama |
| *Leptonema cheesmanae* Mosely, 1933 [Colombia] | Colombia, Costa Rica, Panama |
| *Leptonema complexum* Mosely, 1933 [Panama] | Costa Rica, Panama |
| *Leptonema crassum* Ulmer, 1905 [Brazil] | Argentina, Brazil, Colombia, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Venezuela |
| *Leptonema ekisi* Flint, McAlpine & Ross, 1987 [Panama] | Costa Rica, Panama |
| *Leptonema forficulum* Mosely, 1933 [Panama] | Costa Rica, Nicaragua, Panama |
| *Leptonema fortunum* Flint, McAlpine & Ross, 1987 [Panama] | Costa Rica, Panama |
| *Leptonema hamuli* Flint, McAlpine & Ross, 1987 [Panama] | Costa Rica, Nicaragua, Panama |
| *Leptonema intermedium* Mosely, 1933 [Ecuador] | Colombia, Costa Rica, Ecuador, Panama |
| *Leptonema rafita* Muñoz-Quesada, 1997 [Costa Rica] | Costa Rica, Panama |
| *Leptonema salvini* Mosely, 1933 [Panama] | Costa Rica, Panama |
| *Leptonema simulans* Mosely, 1933 [Panama] | Costa Rica, Panama |
| *Leptonema sinuatum* Mosely, 1933 [Colombia] | Colombia, Costa Rica, Panama |
| *Leptonema sparsum* (Ulmer, 1905) [Brazil] | Argentina, Brazil, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Venezuela |
| *Leptonema tapanti* Muñoz-Quesada, 1997 [Costa Rica] | Costa Rica, Panama |
| *Leptonema turrialbum* Flint, McAlpine & Ross, 1987 [Costa Rica] | Costa Rica, Panama |
| *Leptonema woldianum* Flint, McAlpine & Ross, 1987 [Panama] | Costa Rica, Panama |
| *Macronema burmeisteri* Banks, 1924 [Peru] | Brazil, Costa Rica, Ecuador, Nicaragua, Panama, Peru |
| *Macronema luteipenne* Flint & Bueno-Soria, 1979 [Panama] | Costa Rica, Mexico, Panama |
| *Macronema variipenne* Flint & Bueno-Soria, 1979 [Mexico] | Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Peru |
| *Macrostemum ulmeri* (Banks, 1913) [Colombia] | Brazil, Colombia, Costa Rica, Ecuador, Honduras, Panama, Peru, Suriname, Trinidad |
| *Plectropsyche wallacei* Bueno-Soria & Barba-Álvarez, 2015 [Costa Rica] | Costa Rica, Panama |
| *Smicridea* (*Rhyacophylax*) *acuminata* Flint, 1974 [Costa Rica] | Costa Rica, Ecuador, Panama |
| *Smicridea* (*Rhyacophylax*) *lobata* (Ulmer, 1909) [Venezuela] | Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Venezuela |
| *Smicridea* (*Rhyacophylax*) *murina* McLachlan, 1871 [Chile] | Argentina, Bolivia, Chile, Colombia, Costa Rica, Ecuador, Nicaragua, Panama, Peru, Venezuela |
| *Smicridea* (*Rhyacophylax*) *nemerosa* Holzenthal & Blahnik, 1995 [Costa Rica] | Costa Rica, Panama |
| *Smicridea* (*Rhyacophylax*) *radula* Flint, 1974 [Costa Rica] | Brazil, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama |
| *Smicridea* (*Rhyacophylax*) *talamanca* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Smicridea* (*Rhyacophylax*) *tapanti* Holzenthal & Blahnik, 1995 [Costa Rica] | Costa Rica, Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Smicridea* (*S.*) *bivittata* (Hagen, 1861) [Panama] | Brazil, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Suriname, Tobago, Trinidad, Venezuela |
| *Smicridea* (*S.*) *breviuncata* Flint, 1974 [Costa Rica] | Colombia, Costa Rica, Panama |
| *Smicridea* (*S.*) *campana* Flint, 1974 [Panama] | Panama |
| *Smicridea* (*S.*) *cartiensis* Flint & Denning, 1989 [Panama] | Panama |
| *Smicridea* (*S.*) *catherinae* Blahnik, 1995 [Costa Rica] | Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Panama |
| *Smicridea* (*S.*) *circinata* Flint & Denning, 1989 [Panama] | Panama |
| *Smicridea* (*S.*) *cuna* Flint, 1974 [Panama] | Panama |
| *Smicridea* (*S.*) *dividua* Rázuri-Gonzales & Armitage, 2019 [Panama] | Panama |
| *Smicridea* (*S.*) *filicata* Flint & Denning, 1989 [Costa Rica] | Costa Rica, Panama |
| *Smicridea* (*S.*) *gemina* Blahnik, 1995 [Costa Rica] | Brazil, Colombia, Costa Rica, Ecuador, Nicaragua, Panama |
| *Smicridea* (*S.*) *hybrida* Blahnik, 1995 [Costa Rica] | Costa Rica, Guatemala, Honduras, Nicaragua, Panama |
| *Smicridea* (*S.*) *lata* Rázuri-Gonzales & Armitage, 2019 [Panama] | Panama |
| *Smicridea* (*S.*) *latipala* Flint & Denning, 1989 [Panama] | Panama |
| *Smicridea* (*S.*) *matagalpa* Flint, 1974 [Nicaragua] | Costa Rica, Honduras, Nicaragua, Panama |
| *Smicridea* (*S.*) *mirama* Flint & Denning, 1989 [Panama] | Nicaragua, Panama |
| *Smicridea* (*S.*) *multidens* Flint & Denning, 1989 [Panama] | Panama |
| *Smicridea* (*S.*) *polyfasciata* Martynov, 1912 [Peru] | Bolivia, Colombia, Ecuador, Peru, Panama |
| *Smicridea* (*S.*) *spatulata* Rázuri-Gonzales & Armitage, 2019 [Panama] | Panama |
| *Smicridea* (*S.*) *turrialbana* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Smicridea* (*S.*) *varia* (Banks, 1913) [Costa Rica] | Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama |
| **Suborder Integripalpia Martynov** | |
| **Superfamily Glossosomatoidea Wallengren** | |
| **Family Glossosomatidae Wallengren** | |
| *Culoptila costaricensis* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Culoptila unispina* Blahnik & Holzenthal, 2006 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella akantha* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella anakantha* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella aviceps* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella calovebora* Blahnik & Armitage, 2019 [Panama] | Panama |
| *Mortoniella carinula* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella falcicula* Blahnik & Holzenthal, 2008 [Mexico] | Mexico, Panama |
| *Mortoniella munozi* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella opinionis* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella panamensis* Blahnik & Holzenthal, 2008 [Panama] | Panama |
| *Mortoniella pectinella* Blahnik & Holzenthal, 2008 [Panama] | Panama |
| *Mortoniella redunca* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella rovira* (Flint, 1974) [Panama] | Costa Rica, Panama |
| *Mortoniella stilula* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella tapanti* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella taurina* Blahnik & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Mortoniella umbonata* Blahnik & Holzenthal, 2008 [Panama] | Panama |
| *Mortoniella yayas* Blahnik & Armitage, 2019 [Panama] | Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Protoptila altura* Holzenthal & Blahnik, 2006 [Costa Rica] | Costa Rica, Panama |
| *Protoptila bicornuta* Flint, 1963 [Honduras] | Belize, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama |
| *Protoptila boruca* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Protoptila bribri* Holzenthal & Blahnik, 2006 [Costa Rica] | Costa Rica, Panama |
| *Protoptila cana* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Protoptila chitaria* Holzenthal & Blahnik, 2006 [Costa Rica] | Costa Rica, Panama |
| *Protoptila harrisi* Blahnik, Aguirre & Armitage, 2023 [Panama] | Panama |
| *Protoptila inflata* Blahnik & Armitage, 2019 [Panama] | Panama |
| *Protoptila jolandae* Holzenthal & Blahnik, 2006 [Costa Rica] | Costa Rica, Panama |
| *Protoptila laterospina* Flint, 1967 [Costa Rica] | Costa Rica, Panama |
| *Protoptila orotina* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Protoptila perdida* Bueno-Soria, Santiago-Fragosa & Barba-Álvarez, 2005 [Panama] | Panama |
| *Protoptila rambala* Blahnik & Armitage, 2019 [Panama] | Panama |
| *Protoptila spirifera* Flint, 1974 [Costa Rica] | Costa Rica, Panama |
| *Protoptila tojana* Mosely, 1954 [Mexico] | Costa Rica, Honduras, Mexico, Nicaragua, Panama, Peru |
| *Protoptila totumas* Blahnik & Armitage, 2019 [Panama] | Panama |
| *Protoptila trichoglossa* Holzenthal & Blahnik, 2006 [Costa Rica] | Costa Rica, Panama |
| **Superfamily Hydroptiloidea Stephens** | |
| **Family Hydroptilidae Stephens** | |
| *Alisotrichia asta* Harris & Flint, 2002 [Panama] | Panama |
| *Alisotrichia bernali* Harris & Armitage, 2019 [Panama] | Panama |
| *Alisotrichia coclensis* Armitage & Harris, 2020 [Panama] | Panama |
| *Alisotrichia cuernita* Harris & Flint, 2002 [Panama] | Panama |
| *Alisotrichia eisbergae* Harris & Armitage, 2023 [Panama] | Panama |
| *Alisotrichia latipalpis* Flint, 1991 [Colombia] | Colombia, Panama |
| *Alisotrichia linterna* Harris & Flint, 2002 [Panama] | Panama |
| *Alisotrichia panamensis* Harris & Flint, 2002 [Panama] | Panama |
| *Alisotrichia woldai* Harris & Flint, 2002 [Panama] | Panama |
| *Anchitrichia spangleri* Flint, 1970 [Mexico] | Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama |
| *Angrisanoa bokota* Harris & Armitage, 2023 [Panama] | Panama |
| *Bredinia costaricensis* (Flint, 1967) [Costa Rica] | Costa Rica, Panama |
| *Bredinia dominicensis* Flint, 1968 [Dominica] | Costa Rica, Dominica, Ecuador, Martinique, Panama, Trinidad |
| *Bredinia emarginata* Harris, Holzenthal & Flint, 2003 [Costa Rica] | Costa Rica, Panama |
| *Bredinia paraespinosa* Harris & Armitage, 2023 [Panama] | Panama |
| *Bredinia selva* Harris, Holzenthal & Flint, 2002 [Costa Rica] | Costa Rica, Panama |
| *Bredinia sucrensis* Harris, Holzenthal & Flint, 2003 [Venezuela] | Panama, Venezuela |
| *Byrsopteryx cuchilla* Harris & Holzenthal, 1994 [Costa Rica] | Costa Rica, Panama |
| *Brysopteryx esparta* Harris & Holzenthal, 1994 [Costa Rica] | Costa Rica, Panama |
| *Brysopteryx solisi* Harris & Holzenthal, 1994 [Costa Rica] | Costa Rica, Panama |
| *Cerasmatrichia akanthos* Armitage & Harris, 2020 [Panama] | Panama |
| *Cerasmatrichia armitagei* Harris, Ríos & Aguirre, 2023 [Panama] | Panama |
| *Cerasmatrichia blahniki* Harris & Armitage, 2019 [Panama] | Panama |
| *Cerasmatrichia garfioza* Harris & Armitage, 2023 [Panama] | Panama |
| *Cerasmatrichia veraguasensis* Harris & Armitage, 2023 [Panama] | Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Cerasmatrichia wirthi* (Flint, 1968) [Panama] | Panama |
| *Ceratotrichia fairchildi* Flint, 1992 [Panama] | Panama |
| *Costatrichia calovebora* Harris & Armitage, 2023 [Panama] | Panama |
| *Costatrichia devestiva* Thomson & Armitage, 2018 [Panama] | Panama |
| *Costatrichia dietrichi* Thomson & Armitage, 2018 [Panama] | Panama |
| *Costatrichia falsa* Santos, Takiya & Nessimian, 2013 [Costa Rica] | Costa Rica, Panama |
| *Costatrichia panamensis* Flint, 1967 [Panama] | Panama |
| *Costatrichia santosi* Harris & Armitage, 2019 [Panama] | Panama |
| *Costatrichia spinifera* Flint, 1970 [Panama] | Costa Rica, Panama |
| *Costatrichia tripartita* Flint, 1970 [Panama] | Costa Rica, Panama |
| *Costatrichia venezuelensis* Flint, 1981 [Venezuela] | Costa Rica, Panama, Venezuela |
| *Flintiella heredia* Harris, Flint & Holzenthal, 2002 [Costa Rica] | Costa Rica, Ecuador, Panama, Peru |
| *Flintiella panamensis* Harris, Flint & Holzenthal, 2002 [Panama] | Panama |
| *Flintiella pizotensis* Harris, Flint & Holzenthal, 2002 [Costa Rica] | Brazil, Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Peru |
| *Hydroptila constricta* Bueno-Soria, 1984 [Mexico] | Belize, Colombia, Costa Rica, Honduras, Mexico, Panama, Peru |
| *Hydroptila flinti* Bueno-Soria, 1984 [Costa Rica] | Costa Rica, Panama |
| *Hydroptila grenadensis* Flint, 1968 [Grenada] | Colombia, Ecuador, Grenada, Nicaragua, Panama, Peru, Tobago, Trinidad, Venezuela |
| *Hydroptila maza* Harris & Holzenthal, 1999 [Costa Rica] | Costa Rica, Panama |
| *Hydroptila mexicana* Mosely, 1937 [Mexico] | Costa Rica, Honduras, Mexico, Nicaragua, Panama |
| *Hydroptila nusagandia* Harris & Holzenthal, 1999 [Panama] | Panama |
| *Hydroptila paradenza* Harris & Holzenthal, 1999 [Costa Rica] | Costa Rica, Mexico, Nicaragua, Panama |
| *Hydroptila paschia* Mosely, 1937 [Mexico] | Costa Rica, Mexico, Nicaragua, Panama |
| *Hydroptila rastrilla* Harris & Holzenthal, 1999 [Costa Rica] | Costa Rica, Panama |
| *Hydroptila singri* Harris & Holzenthal, 1999 [Costa Rica] | Costa Rica, Panama |
| *Hydroptila veracruzensis* Flint, 1967 [Mexico] | Costa Rica, Mexico, Nicaragua, Panama, Trinidad, Venezuela |
| *Leucotrichia botosaneanu* Flint, 1996 [Tobago] | Panama, Tobago |
| *Leucotrichia chiriquiensis* Flint, 1970 [Panama] | Panama |
| *Leucotrichia cortadera* Thomson, Armitage & Harris, 2021 [Panama] | Panama |
| *Leucotrichia cultrata* Thomson & Armitage, 2021 [Panama] | Panama |
| *Leucotrichia extraordinaria* Bueno-Soria, Santiago-Fragoso & Barba-Álvarez, 2001 [Mexico] | Mexico, Panama |
| *Leucotrichia fairchildi* Flint, 1970 [Panama] | Colombia, Costa Rica, Ecuador, El Salvador, Grenada, Panama, Tobago, Trinidad, Venezuela |
| *Leucotrichia hispida* Thomson & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Leucotrichia holzenthali* Thomson, Armitage & Harris, 2021 [Panama] | Panama* |
| *Leucotrichia luma* Thomson, Armitage & Harris, 2021 [Trinidad] | Panama, Trinidad |
| *Leucotrichia melleopicta* Mosely, 1934 [Mexico] | Mexico, Panama, Venezuela |
| *Leucotrichia mutica* Flint, 1991 [Colombia] | Colombia, Panama |
| *Leucotrichia rhomba* Thomson & Holzenthal, 2015 [Costa Rica] | Costa Rica, Panama |
| *Leucotrichia ruiteri* Thomson, Armitage & Harris, 2021 [Panama] | Panama* |
| *Leucotrichia topora* (Oláh & Flint, 2012) [Panama] | Panama |
| *Leucotrichia viridis* Flint, 1967 [Guatemala] | El Salvador, Guatemala, Mexico, Panama |
| *Mayatrichia ayama* Mosely, 1937 [Panama] | Canada, Costa Rica, Honduras, Mexico, Nicaragua, Panama, U.S.A |

| Species [Type Country] | Distribution |
|---|---|
| *Mayatrichia illobia* Harris & Holzenthal, 1990 [Costa Rica] | Costa Rica, Ecuador, Panama |
| *Metrichia aikidion* Thomson & Armitage, 2021 [Panama] | Panama |
| *Metrichia amplitudinis* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia ancora* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia angulosa* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia avon* (Bueno-Soria, 1983) [Mexico] | Costa Rica, Mexico, Panama |
| *Metrichia biungulata* (Flint, 1972) [Panama] | Costa Rica, Panama |
| *Metrichia brevitas* Bueno-Soria & Santiago-Fragoso, 2002 [Panama] | Panama |
| *Metrichia brocha* Thomson & Armitage, 2018 [Panama] | Panama |
| *Metrichia calla* Thomson & Armitage, 2018 [Panama] | Panama |
| *Metrichia calovebora* Harris & Armitage, 2023 [Panama] | Panama |
| *Metrichia cascada* Harris & Armitage, 2023 [Panama] | Panama |
| *Metrichia chiriquiensis* Harris & Armitage, 2023 [Panama] | Panama |
| *Metrichia continentalis* (Flint, 1972) [Panama] | Panama |
| *Metrichia corazones* Armitage & Harris, 2020 [Panama] | Panama |
| *Metrichia decora* Navás, 1932 [Costa Rica] | Costa Rica, Panama |
| *Metrichia difusa* Bueno-Soria & Santiago-Fragoso, 2002 [Panama] | Panama |
| *Metrichia enigmatica* Bueno-Soria & Santiago-Fragoso, 2002 [Panama] | Panama |
| *Metrichia escobilla* Harris & Armitage, 2023 [Panama] | Panama |
| *Metrichia hocica* Harris, Rios & Aguirre, 2023 [Panama] | Panama |
| *Metrichia langosta* Armitage & Harris, 2023 [Panama] | Panama |
| *Metrichia leahae* Harris & Armitage, 2023 [Panama] | Panama |
| *Metrichia lemniscata* (Flint, 1972) [Panama] | Costa Rica, Panama |
| *Metrichia macdonaldi* Harris & Armitage, 2019 [Panama] | Panama |
| *Metrichia macrophallata* Flint, 1991 [Panama] | Costa Rica, Ecuador, Panama |
| *Metrichia malada* (Flint, 1991) [Colombia] | Colombia, Panama, Peru |
| *Metrichia mechuda* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia meta* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia nigritta* (Banks, 1907) [U.S.A.] | El Salvador, Mexico, Panama, U.S.A. |
| *Metrichia nowaczyki* Harris & Armitage, 2015 [Panama] | Panama |
| *Metrichia* PA-1* Thomson & Armitage, 2021 [Panama] | Panama |
| *Metrichia palida* Bueno-Soria & Santiago-Fragoso, 2002 [Panama] | Panama |
| *Metrichia penicillata* (Flint, 1972) [Guatemala] | Costa Rica, Guatemala, Nicaragua, Panama |
| *Metrichia picuda* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia plax* Thomson & Armitage, 2021 [Panama] | Panama |
| *Metrichia pseudopatagonica* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia quadrata* (Flint, 1972) [Mexico] | Costa Rica, Mexico, Panama |
| *Metrichia sacculifera* (Flint, 1991) [Colombia] | Colombia, Panama |
| *Metrichia savegra* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia sencilla* Harris & Armitage, 2015 [Panama] | Panama |
| *Metrichia separata* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia sesquipedalis* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia spica* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia tatianae* Harris & Armitage, 2023 [Panama] | Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Metrichia thomsonae* Harris & Armitage, 2019 [Panama] | Panama |
| *Metrichia thurmani* Harris & Armitage, 2019 [Panama] | Panama |
| *Metrichia trebeki* Harris & Armitage, 2019 [Panama] | Panama |
| *Metrichia triangula* Bueno-Soria & Santiago-Fragoso, 2002 [Panama] | Panama |
| *Metrichia triquetra* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Metrichia truncata* Bueno-Soria & Holzenthal, 2003 [Costa Rica] | Costa Rica, Panama |
| *Neotrichia abrebotella* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia amplector* Keth, 2004 [Mexico] | Mexico, Panama |
| *Neotrichia anzuelo* Armitage & Harris, 2018 [Panama] | Panama |
| *Neotrichia armata* Botosaneanu, 1993 (in Botosaneanu and Alkins-Koo, 1993) [Tobago] | Panama, Tobago, Trinidad |
| *Neotrichia atopa* Thomson & Armitage, 2018 [Panama] | Panama |
| *Neotrichia candela* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia canixa* (Mosely, 1937) [Mexico] | Mexico, Panama, U.S.A. |
| *Neotrichia carlsoni* Harris & Armitage, 2019 [Panama] | Panama |
| *Neotrichia codaza* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia collierorum* Armitage & Harris, 2018 [Panama] | Panama |
| *Neotrichia embera* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia esmalda* (Mosely, 1937) [Mexico] | Costa Rica, Mexico, Nicaragua,Panama |
| *Neotrichia espinosa* Armitage & Harris, 2020 [Panama] | Panama |
| *Neotrichia flennikeni* Harri, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia flowersi* Harris, 1990 [Panama] | Panama |
| *Neotrichia hiaspa* (Mosely, 1937) [Mexico] | Mexico, Nicaragua, Panama |
| *Neotrichia honda* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia kampa* Oláh & Johanson, 2011 [Peru] | Panama, Peru |
| *Neotrichia landisi* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia lenati* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia majagua* Harris, Rios & Aguirre, 2023 [Panama] | Panama |
| *Neotrichia malickyi* Harris, 1993 (in Harris and Tiemann 1993) [Panama] | Panama |
| *Neotrichia michaeli* Armitage & Harris, 2020 [Panama] | Panama |
| *Neotrichia mindyae* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia minutisimella* (Chambers, 1873) [North America] | Canada, Panama, U.S.A. |
| *Neotrichia pamelae* Harris & Armitage, 2015 [Panama] | Panama |
| *Neotrichia panamensis* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia parabullata* Harris & Armitage, 2015 [Panama] | Panama |
| *Neotrichia parajarochita* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia paraxicana* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia pierpointorum* Armitage & Harris, 2020 [Panama] | Panama |
| *Neotrichia rambala* Harris & Armitage, 2019 [Panama] | Panama |
| *Neotrichia serrata* Harris & Armitage, 2019 [Panama] | Panama |
| *Neotrichia snixae* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia solapa* Harris, Rios & Aguirre, 2023 [Panama] | Panama |
| *Neotrichia spangleri* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia starki* Harris & Armitage, 2019 [Panama] | Panama |
| *Neotrichia tatianae* Armitage & Harris, 2018 [Panama] | Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Neotrichia tauricornis* Malicky, 1980 [Guadeloupe] | Colombia, Grenada, Guadeloupe, Martinique, Panama, St Lucia, Tobago, Trinidad |
| *Neotrichia tuxtla* Bueno-Soria, 1999 [Mexico] | Mexico, Panama |
| *Neotrichia unamas* Botosaneanu, 1993 (in Botosaneanu and Alkins-Koo, 1993) [Tobago] | Panama, Tobago, Trinidad, Venezuela |
| *Neotrichia veraguasensis* Harris, Armitage & Rios 2024 [Panama] | Panama |
| *Neotrichia vibrans* Ross, 1944 [U.S.A.] | Mexico, Panama, U.S.A. |
| *Neotrichia xicana* (Mosely, 1937) [Mexico] | Mexico, Nicaragua, Panama |
| *Neotrichia yayas* Armitage & Harris, 2020 [Panama] | Panama |
| *Nothotrichia panama* Harris & Armitage, 2015 [Panama] | Panama |
| *Ochrotrichia aldama* (Mosely, 1937) [Mexico] | Costa Rica, Dominican Republic (in amber), Mexico, Panama |
| *Ochrotrichia alma* Thomson & Armitage, 2021 [Panama] | Panama |
| *Ochrotrichia anomala* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia anticheirion* Thomson & Armitage, 2018 [Panama] | Panama |
| *Ochrotrichia arranca* (Mosely, 1937) [Mexico] | Costa Rica, Mexico, Panama |
| *Ochrotrichia arriba* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia assita* Bueno-Soria & Holzenthal, 2004 [Panama] | Costa Rica, Panama |
| *Ochrotrichia avis* Bueno-Soria & Holzenthal, 1998 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia bicaudata* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia birdae* Harris & Armitage, 2019 [Panama] | Panama |
| *Ochrotrichia boquillas* Moulton & Harris, 1997 [U.S.A.] | Mexico, Panama, U.S.A. |
| *Ochrotrichia caimita* Flint, 1972 [Panama] | Costa Rica, Panama |
| *Ochrotrichia conejoreja* Harris & Armitage, 2023 [Panama] | Panama |
| *Ochrotrichia conformalis* Bueno-Soria & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia corneolus* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia crucecita* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia curvata* Bueno-Soria & Holzenthal, 2004 [Panama] | Panama |
| *Ochrotrichia dewalti* Harris & Armitage, 2019 [Panama] | Panama |
| *Ochrotrichia filiforma* Flint, 1972 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia flagellata* Flint, 1972 [Panama] | Panama, Mexico |
| *Ochrotrichia glabra* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Costa Rica, Panama |
| *Ochrotrichia jolandae* Bueno-Soria & Holzenthal, 2008 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia kondratieffi* Harris & Armitage, 2019 [Panama] | Panama |
| *Ochrotrichia latigiza* Harris, Rios & Aguirre, 2023 [Panama] | Panama |
| *Ochrotrichia longispina* Bueno-Soria & Holzenthal, 2004 [Panama] | Costa Rica, Panama, Peru |
| *Ochrotrichia lupita* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia moselyi* Flint, 1972 [Mexico] | Costa Rica, Guatemala, Mexico, Panama |
| *Ochrotrichia ngabebuglea* Harris, Rios & Aguirre, 2023 [Panama] | Panama |
| *Ochrotrichia nimmoi* Harris & Armitage, 2015 [Panama] | Panama |
| *Ochrotrichia pacifica* Flint, 1972 [Panama] | Costa Rica, Mexico, Panama |
| *Ochrotrichia panamensis* Flint, 1972 [Panama] | Costa Rica, Nicaragua, Panama |
| *Ochrotrichia paraflagellata* Harris & Armitage, 2023 [Panama] | Panama |
| *Ochrotrichia paraldama* Bueno-Soria, 2009 [Panama] | Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Ochrotrichia paxilla* Thomson & Armitage, 2021 [Panama] | Panama |
| *Ochrotrichia petersoni* Thomson & Armitage, 2021 [Panama] | Panama |
| *Ochrotrichia pulgara* Harris & Armitage, 2015 [Panama] | Panama |
| *Ochrotrichia quinealensis* Bueno-Soria & Holzenthal, 1998 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia ramona* Bueno-Soria & Holzenthal, 1998 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia regina* Bueno-Soria & Santiago-Fragoso, 1997 [Panama] | Panama |
| *Ochrotrichia silva* Bueno-Soria & Holzenthal, 1998 [Costa Rica] | Costa Rica, Panama |
| *Ochrotrichia tenanga* (Mosely, 1937) [Mexico] | Costa Rica, Guatemala, Honduras, Mexico, Panama, Peru, Venezuela |
| *Ochrotrichia unica* Bueno-Soria & Santiago-Fragoso, 1992 [Colombia] | Colombia, Panama |
| *Orthotrichia aegerfasciella* (Chambers, 1873) [U.S.A.] | Canada, Cuba, Dominican Republic, Haiti, Mexico, Nicaragua, Panama, U.S.A. |
| *Oxyethira* (*Argyrobothrus*) *glasa* (Ross, 1941) [U.S.A.] | Costa Rica, Cuba, Nicaragua, Panama, U.S.A. |
| *Oxyethira* (*Dampfitrichia*) *arizona* Ross, 1948 [U.S.A.] | Costa Rica, Cuba, Dominica, Jamaica, Martinique, Mexico, Nicaragua, Panama, Puerto Rico, U.S.A. |
| *Oxyethira* (*Dampfitrichia*) *circaverna* Kelley, 1983 [Panama] | Argentina, Brazil, Curacao, Ecuador, Panama, Uruguay |
| *Oxyethira* (*Dampfitrichia*) *maya* Denning, 1947 [U.S.A.] | Mexico, Panama, U.S.A. |
| *Oxyethira* (*Dampfitrichia*) *simulatrix* Flint, 1968 [Jamaica] | Costa Rica, Cuba, Dominican Republic, Guadeloupe, Haiti, Jamaica, Mexico, Nicaragua, Panama, U.S.A. |
| *Oxyethira* (*Loxotrichia*) *azteca* (Mosely, 1937) [Mexico] | Belize, Colombia, Costa Rica, Ecuador, French Guiana, Grenada, Guatemala, Mexico, Nicaragua, Panama, Peru, Suriname, Tobago, Trinidad, Venezuela, U.S.A. |
| *Oxyethira* (*Loxotrichia*) *janella* Denning, 1948 [U.S.A.] | Barbados [?], Costa Rica [?], Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique [?], Mexico, Panama, Puerto Rico, St. Lucia, St. Vincent, U.S.A. [?=some records from Central America likely *O. tica*] |
| *Oxyethira* (*Loxotrichia*) *parazteca* Kelley, 1983 [Ecuador] | Costa Rica, Ecuador, Panama |
| *Oxyethira* (*Loxotrichia*) *parce* (Edwards & Arnold, 1961) [U.S.A.] | Argentina, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Guyana, Mexico, Panama, Peru, Trinidad, Venezuela, U.S.A. |
| *Oxyethira* (*Loxotrichia*) *tica* Holzenthal & Harris, 1992 [Costa Rica] | Brazil, Costa Rica, Dominica, Ecuador, French Guiana, Grenada, Guadeloupe, Honduras, Martinique, Mexico, Nicaragua, Panama, St. Lucia, St. Vincent, Trinidad, Venezuela |
| *Oxyethira* (*Oxytrichia*) *apinolada* Holzenthal & Harris, 1992 [Costa Rica] | Costa Rica, Panama |
| *Oxyethira* (*Oxytrichia*) *culebra* Holzenthal & Harris, 1992 [Costa Rica] | Costa Rica, Panama |
| *Oxyethira* (*Tanytrichia*) *hilosa* Holzenthal & Harris, 1992 [Costa Rica] | Costa Rica, Mexico, Nicaragua, Panama |
| *Oxyethira* (unplaced) *buenoi* Harris & Armitage, 2019 [Panama] | Panama |
| *Oxyethira* (unplaced) *pehrssonae* Harris & Armitage, 2023 [Panama] | Panama |
| *Oxyethira* (unplaced) *rareza* Holzenthal & Harris, 1992 [Costa Rica] | Costa Rica, Panama |
| *Oxyethira* (unplaced) *sierruca* Holzenthal & Harris,1992 [Costa Rica] | Costa Rica, Panama |
| *Rhyacopsyche hasta* Wasmund & Holzenthal, 2007 [Peru] | Panama, Peru |
| *Rhyacopsyche holzenthali* Harris & Armitage, 2019 [Panama] | Panama |
| *Rhyacopsyche mexicana* Flint, 1967 [Mexico] | Costa Rica, Guatemala, Mexico, Nicaragua, Panama |
| *Rhyacopsyche obliquia* Flint, 1974 [Mexico] | Mexico, Panama |
| *Rhyacopsyche ramphisa* Wasmund & Holzenthal, 2007 [Colombia] | Colombia, Costa Rica, Panama, Peru |
| *Rhyacopsyche torulosa* Flint, 1971 [Guatemala] | Costa Rica, Guatemala, Panama |
| *Rhyacopsyche totuma* Thomson & Armitage, 2018 [Panama] | Panama |
| *Rhyacopsyche turrialbae* Flint, 1971 [Costa Rica] | Costa Rica, Panama |
| *Tizatetrichia costaricensis* Harris, Flint & Holzenthal, 2002 [Costa Rica] | Costa Rica, Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Tizatetrichia escabrosa* Armitage, Harris & Aguirre, 2023 [Panama] | Panama |
| *Tizatetrichia paloseco* Armitage, Harris & Aguirre, 2023 [Panama] | Panama |
| *Tizatetrichia panamensis* Harris & Armitage, 2019 [Panama] | Panama |
| *Zumatrichia angulata* Flint, 1970 [Panama] | Panama |
| *Zumatrichia antilliensis* Flint, 1968 [Dominica] | Colombia, Dominica, Ecuador, Grenada, Guadeloupe, Martinique, Panama, St. Lucia, St. Vincent, Venezuela |
| *Zumatrichia attenuata* Flint, 1970 [Costa Rica] | Costa Rica, Panama |
| *Zumatrichia bifida* Flint, 1970 [Costa Rica] | Costa Rica, Panama |
| *Zumatrichia caudifera* Flint, 1970 [Panama] | Costa Rica, Nicaragua, Panama |
| *Zumatrichia chiriquiensis* Flint, 1970 [Panama] | Costa Rica, Panama |
| *Zumatrichia culebra* Harris & Armitage, 2023 [Panama] | Panama |
| *Zumatrichia dereka* Oláh & Flint, 2012 [Panama] | Panama |
| *Zumatrichia flinti* Harris & Armitage, 2019 [Panama] | Panama |
| *Zumatrichia galtena* Mosely, 1937 [Mexico] | Costa Rica, Honduras, Mexico, Nicaragua, Panama |
| *Zumatrichia hazelae* Harris & Armitage, 2019 [Panama] | Panama |
| *Zumatrichia maskara* Oláh & Flint, 2012 [Panama] | Panama |
| *Zumatrichia nelkula* Oláh & Flint, 2012 [Panama] | Panama |
| *Zumatrichia palmara* Flint, 1970 [El Salvador] | Costa Rica, Ecuador, El Salvador, Nicaragua, Panama, Peru |
| *Zumatrichia pluma* Armitage & Harris, 2023 [Panama] | Panama |
| *Zumatrichia rhamphiodes* Flint, 1970 [Costa Rica] | Costa Rica, Panama |
| *Zumatrichia saluda* Flint, 1970 [Panama] | Panama |
| *Zumatrichia sortetla* Oláh & Flint, 2012 [Panama] | Panama |
| *Zumatrichia strobilina* Flint, 1970 [Costa Rica] | Costa Rica, Panama |
| *Zumatrichia teribe* Harris & Armitage, 2015 [Panama] | Panama |
| *Zumatrichia turuda* Oláh & Flint, 2012 [Panama] | Panama |
| *Zumatrichia zegla* Harris & Armitage, 2015 [Panama] | Panama |
| **Superfamily Rhyacophiloidea Stephens** | |
| **Family Hydrobiosidae Ulmer** | |
| *Atopsyche callosa* (Navás, 1924) [Costa Rica] | Argentina, Bolivia, Colombia, Costa Rica, Ecuador, Panama, Peru, Venezuela |
| *Atopsyche chimpuocllo* Schmid, 1989 [Costa Rica] | Costa Rica, Panama |
| *Atopsyche cira* (Mosely, 1949) [Costa Rica] | Costa Rica, Panama |
| *Atopsyche dampfi* Ross & King, 1952 [Mexico] | Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama |
| *Atopsyche erigia* Ross, 1947 [Mexico] | Brazil, Costa Rica, Guatemala, Nicaragua, Mexico, Panama, U.S.A. |
| *Atopsyche huainacapac* Schmid, 1989 [Costa Rica] | Costa Rica, Panama |
| *Atopsyche implexa* (Navás, 1924) [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Atopsyche jaba* Blahnik & Gottschalk, 1997 [Costa Rica] | Costa Rica, Panama |
| *Atopsyche majada* Ross, 1947 [Mexico] | Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Mexico, Panama |
| *Atopsyche minimajada* Blahnik & Gottschalk, 1997 [Costa Rica] | Costa Rica, Panama |
| *Atopsyche pachacamac* Schmid, 1989 [Costa Rica] | Costa Rica, Panama |
| **Superfamily Leptoceroidea Leach** | |
| **Family Calamoceratidae Ulmer** | |
| *Banyallarga acutiterga* (Denning & Hogue, 1983) (in Denning et al. 1983) [Costa Rica] | Costa Rica, Panama |
| *Banyallarga fortuna* (Resh, 1983) (in Denning et al. 1983) [Panama] | Costa Rica, Panama |
| *Phylloicus aeneus* (Hagen, 1861) [Mexico] | Belize, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, U.S.A. |

| Species [Type Country] | Distribution |
|---|---|
| *Phylloicus blahniki* Prather, 2003 [Costa Rica] | Costa Rica, Panama |
| *Phylloicus elegans* Hogue &v Denning, 1983 (in Denning et al. 1983) [Panama] | Colombia, Costa Rica, Ecuador, Nicaragua, Panama |
| *Phylloicus lituratus* Banks, 1920 [Colombia] | Argentina, Colombia, Costa Rica, Ecuador, Nicaragua, Panama, Venezuela |
| *Phylloicus munozi* Prather, 2003 [Costa Rica] | Colombia, Costa Rica, Panama |
| *Phylloicus nigripennis* (Banks, 1900) [Mexico] | Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, Panama |
| *Phylloicus panamensis* Prather, 2003 [Panama] | Costa Rica, Panama |
| **Family Leptoceridae Leach** | |
| *Atanatolica moselyi* Denning & Holzenthal, 1988 (in Holzenthal, 1988) [Costa Rica] | Costa Rica, Panama |
| *Atanatolica panamensis* Holzenthal, 1988 [Panama] | Panama |
| *Nectopsyche dorsalis* (Banks, 1901) [Mexico] | Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, U.S.A., Venezuela |
| *Nectopsyche gemmoides* Flint, 1981 [Venezuela] | Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Guyana, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad, Venezuela |
| *Nectopsyche ortizi* Holzenthal, 1995 [Costa Rica] | Argentina, Brazil, Costa Rica, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Venezuela |
| *Nectopsyche pavida* (Hagen, 1861) [U.S.A.] | Canada, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, U.S.A. |
| *Nectopsyche punctata* (Ulmer, 1905) [Brazil] | Argentina, Bolivia, Brazil, Colombia, Costa Rica, Ecuador, Guyana, Mexico, Panama, Paraguay, Peru, Suriname, Venezuela |
| *Nectopsyche spiloma* (Ross, 1944) [U.S.A.] | Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, U.S.A. |
| *Nectopsyche tuanis* Holzenthal, 1995 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Oecetis acciptrina* Blahnik & Holzenthal, 2014 [Ecuador] | Costa Rica, Ecuador, Panama |
| *Oecetis constricta* Blahnik & Holzenthal, 2014 [Costa Rica] | Colombia, Costa Rica, Ecuador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Trinidad, Venezuela |
| *Oecetis falicia* Denning, 1966 (in Denning and Sykora 1966) [Panama] | Panama |
| *Oecetis hastapulla* Quinteiro & Holzenthal, 2017 [Costa Rica] | Costa Rica, Panama |
| *Oecetis inconspicua* (Walker, 1852) [U.S.A.] | Bahamas, Bolivia, Brazil, Canada, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Puerto Rico, U.S.A., Venezuela |
| *Oecetis knutsoni* Flint, 1981 [Venezuela] | Bolivia, Brazil, Colombia, Guadeloupe, Panama, Peru, Venezuela |
| *Oecetis mexicana* Blahnik & Holzenthal, 2014 [Mexico] | Costa Rica, Ecuador, Honduras, Mexico, Panama, Venezuela |
| *Oecetis protrusa* Blahnik & Holzenthal, 2014 [Costa Rica] | Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama |
| *Oecetis pseudoinconspicua* Bueno-Soria, 1981 [Mexico] | Costa Rica, Mexico, Panama |
| *Oecetis punctipennis* (Ulmer, 1905) [Brazil] | Argentina, Bolivia, Brazil, Costa Rica, Ecuador, Guyana, Nicaragua, Panama, Peru, Suriname, Venezuela |
| *Triaenodes anomalous* Flint, 1967 [Mexico] | Mexico, Nicaragua, Panama |
| *Triaenodes clauseni* Holzenthal & Andersen, 2004 [Costa Rica] | Costa Rica, Nicaragua, Panama |
| *Triaenodes delicatus* Navás, 1924 [Costa Rica] | Costa Rica, Panama |
| *Triaenodes guadaloupe* Holzenthal & Andersen, 2004 [Panama] | Panama |
| *Triaenodes hornitos* Holzenthal & Andersen, 2004 [Panama] | Panama |
| *Triaenodes morai* Holzenthal & Andersen, 2004 [Costa Rica] | Costa Rica, Nicaragua, Panama |

| Species [Type Country] | Distribution |
|---|---|
| *Triaenodes nicaraguensis* Holzenthal & Andersen, 2004 [Nicaragua] | Nicaragua, Panama |
| *Triaenodes talamanca* Holzenthal & Andersen, 2004 [Costa Rica] | Costa Rica, Panama |
| *Triaenodes tapanti* Holzenthal & Andersen 2004 [Costa Rica] | Costa Rica, Panama |
| *Triaenodes tico* Holzenthal & Andersen, 2004 [Costa Rica] | Costa Rica, Panama |
| *Triaenodes woldai* Holzenthal & Andersen, 2004 [Panama] | Panama |
| *Triplectides flintorum* Holzenthal, 1988 [Costa Rica] | Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Suriname |
| **Family Odontoceridae Wallengren** | |
| *Marilila crea* Mosely, 1949 [Costa Rica] | Costa Rica, Panama |
| *Marilia flexuosa* Ulmer, 1905 [U.S.A.] | Argentina, Brazil, Canada, Colombia, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, Peru, U.S.A. |
| *Marilia kingsolveri* Bueno-Soria & Rojas-Ascencio, 2004 [Costa Rica] | Costa Rica, Panama |
| **Superfamily Sericostomatoidea Stephens** | |
| **Family Anomalopsychidae Ulmer** | |
| *Contulma talamanca* Holzenthal & Flint, 1995 [Costa Rica] | Costa Rica, Panama |
| **Family Helicopsychidae Ulmer** | |
| *Helicopsyche* (*Feropsyche*) *alajuela* Johanson & Holzenthal, 2010 [Costa Rica] | Costa Rica, Panama |
| *Helicopsyche* (*Feropsyche*) *blantoni* Johanson & Malm, 2006 [Panama] | Panama |
| *Helicopsyche* (*Feropsyche*) *borealis* (Hagen, 1861) [Canada] | Canada, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, U.S.A. |
| *Helicopsyche* (*Feropsyche*) *breviterga* Flint, 1991 [Colombia] | Colombia, Ecuador, Panama, Venezuela |
| *Helicopsyche* (*Feropsyche*) *chiriquensis* Johanson & Malm, 2006 [Panama] | Costa Rica, Panama |
| *Helicopsyche* (*Feropsyche*) *fridae* Johanson, 2003 [Panama] | Panama |
| *Helicopsyche* (*Feropsyche*) *incisa* Ross, 1956 [Mexico] | Costa Rica, Mexico, Nicaragua, Panama |
| *Helicopsyche* (*Feropsyche*) *linguata* Johanson & Malm, 2006 [Panama] | Panama |
| *Helicopsyche* (*Feropsyche*) *planata* Ross, 1956 [Mexico] | Mexico, Nicraragua, Panama |
| *Helicopsyche* (*Feropsyche*) *rentzii* Denning & Blickle, 1979 [Costa Rica] | Costa Rica, Panama |
| *Helicopsyche* (*Feropsyche*) *sanblasensis* Johanson & Malm, 2006 [Panama] | Panama |
| *Helicopsyche* (*Feropsyche*) *truncata* Ross, 1956 [Mexico] | Costa Rica, Mexico, Panama |
| *Helicopsyche* (*Feropsyche*) *tuxtlensis* Bueno-Soria, 1983 [Mexico] | Guatemala, Mexico, Panama |
| *Helicopsyche* (*Feropsyche*) *vergelana* Ross, 1956 [Mexico] | Belize, Brazil, Costa Rica, Grenada, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Tobago, Trinidad, Venezuela |
| *Helicopsyche* (*Feropsyche*) *woldai* Johanson, 2003 [Panama] | Panama |
| **Superfamily Limnephiloidea Kolenati** | |
| **Family Limnephilidae Kolenati** | |
| *Limnephilus hamifer* Flint, 1963 [Costa Rica] | Costa Rica, Panama |
| **Superfamily Phryganeoidea Leach** | |
| **Family Lepidostomatidae Ulmer** | |
| *Lepidostoma chiriquiensis* Holzenthal & Strand, 1992 [Panama] | Panama |
| *Lepidostoma ectopium* Holzenthal & Strand, 1992 [Costa Rica] | Costa Rica, Panama |
| *Lepidostoma griseum* (Banks, 1911) [U.S.A.] | Canada, Panama, U.S.A. |
| *Lepidostoma mexicanum* (Banks, 1901) [Mexico] | Costa Rica, Guatemala, Mexico, Panama, U.S.A. |
| *Lepidostoma polylepidum* Holzenthal & Strand, 1992 [Costa Rica] | Costa Rica, Panama |
| *Lepidostoma reimoseri* Flint & Bueno-Soria, 1977 [Costa Rica] | Costa Rica, Panama |
| *Lepidostoma tapanti* Holzenthal & Strand, 1992 [Costa Rica] | Costa Rica, Panama |